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JUN 23 1912

THE ACCESSORY -AND- GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. 1. PAWTUCKET, R. I., NOVEMBER, 1911. NO.

MONOGRAM OIL

"BEST FOR YOUR ENGINE"

UNIVERSITY OF CALIFORNIA

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Can you afford to disregard *your own* interests and not carry

MONOGRAM OIL

The following are some reasons why you should handle it:
It is a good oil and will satisfy your customers in every way.
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Are you planning business for the future or do you expect to give it up next year? You cannot build a reputation with inferior lubricants. There are too many come-backs. You may make more money for a year, but those come-backs wipe out the profits. Cut prices and large discounts are never obtained in High Grade Automobile Oils. The KINCAID line will increase your business, bring you new customers and keep present ones satisfied.

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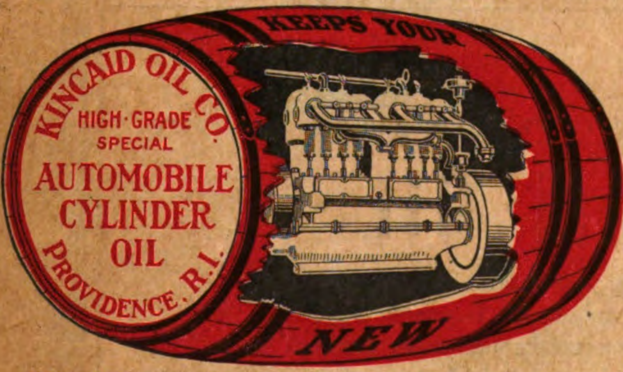
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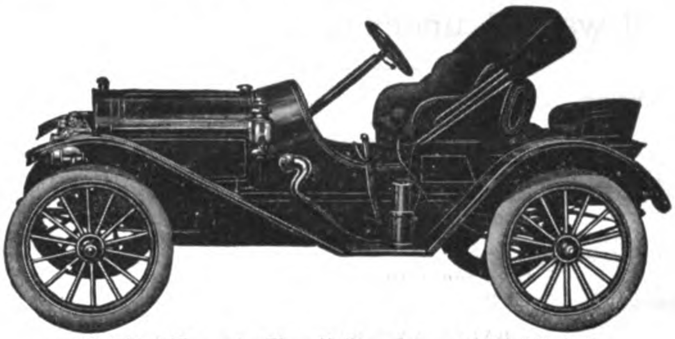
Because we have the simplest and most practical car to manufacture, and it is built entirely in our own works.



METZ "Twenty-Two" Roadster 1912 Model.
Completely Equipped as Shown $495.

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WHY?

Because our exceedingly low overhead and selling expenses add no excessive burden to the actual cost of materials and manufacture.

The METZ "Twenty-Two" is the greatest automobile value ever offered and is the first four-cylinder runabout to be sold for less than $500.

The first four-cylinder runabout completely equipped as shown in above illustration, including **Bosch Magneto and Goodrich Tires**, ever sold for less than $750.

The METZ "Twenty-Two" is also the most economical runabout. It will carry you from 28 to 32 miles on a gallon of gasoline, 100 miles on a pint of lubricating oil, and 8000 to 10,000 miles on a set of tires.

The METZ "Twenty-Two" is guaranteed to climb the hills as fast as any car, regardless of price or power.

It is extremely easy riding, simple in its operation, responsive to the least touch of the throttle, and a car that any man, regardless of what make of large car he might own, would be proud to drive.

It is the most practical car for business or professional men or for those who want simplicity with quality, and a car dependable under all conditions.

In the METZ "Twenty-Two" you have the greatest automobile efficiency at the least possible cost.

Read the specifications carefully, compare them with any other car near the price, and you will instantly appreciate just what a revolution in automobile prices the METZ "Twenty-Two" runabout is at $495—not overlooking the fact that the equipment is included in this figure.

MOTOR—4 cylinders, cast en-bloc—3¾-inch bore, 4-inch stroke. Valves, push rods and springs completely enclosed.

VALVES—Enclosed, liberal in size, inlet and exhaust, right-hand side of motor.

COOLING SYSTEM—Thermo-syphon.

WATER CAPACITY—3½ gallons.

CARBURETOR—Float feed automatic.

HORSE POWER—22 H. P.

IGNITION—High tension magneto.

LUBRICATION—Constant level splash system, operated by pump.

FRAME—Pressed steel channel section.

SPRINGS—Full elliptic all around.

AXLES—(front and rear). Both of cold drawn steel tubing.

WHEEL BASE—90 inches.

WHEELS—30-inch artillery type.

TIRES—Standard Clincher, best quality, 30x3-inch.

BRAKES—Multiple disc brakes in rear hubs.

BODY—Wood with metal panel. Seat neatly upholstered in genuine leather.

COLOR—Battleship gray, white striping.

EQUIPMENT—High tension Magneto, Top, Slip Cover, Gas Lamps and Generator, Dash Lamps, Tail Light, Horn, Set of Tools, Tire Pump, and Complete Tire Outfit. This equipment is furnished without additional charge.

CONTROL—Two foot pedals, one operates the brakes, the other the clutch. Shifting side lever, selective change gear. Throttle adjusting lever on steering column.

STEERING GEAR—Rack and pinion adjustable for wear.

GASOLINE TANK—Capacity 7 gallons, providing a mileage capacity of over 200 miles.

TREAD—48 inches or standard. Construction of a type that either tread can be obtained by simply reversing wheels.

SHAFTS—Crank and cam shafts, drop forged, heat treated, with all surfaces ground to absolute accuracy.

BEARINGS—Superior white metal in motor, ball bearings in transmission and wheels.

SPEED—5 to 10 miles per hour on hig gear.

WEIGHT—Completely equipped. 100 pounds.

GEAR RATIO—3-1 on high gear.

PRICE INCLUDING COMPLET EQUIPMENT $495.

Owing to the big demand for these cars, we will fill all orders strictly in the order of their receipt. This is the sensation of the automobile industry and your order should be placed at once to avoid disappointmen

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We have a splendid propos tion to make to live automobil agents everywhere who are fa sighted enough to take adva tage of the sensation this offer will create. Write today for particulars.

METZ COMPANY, Waltham, Mass.

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Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, Mass. **Branch**: 113 Massachusetts Ave., Boston, Mass.

Hopewell Brothers, Newton, Mass. **Branch:** 1974 Broadway at 67th St., New York City.

Lucas & Co., Brookline, Mass.

Miller, Chas. E., 97-101 Reade St., New York City. **Branches:** 202-204 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., New York City; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia, Penn.; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence, R. I.

ACETYLENE TANKS.

Prest-O-Lite Company, 271 East South St., Indianapolis, Ind. (Prest-O-Lite.) **Branches:** Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, East Cambridge, Jacksonville, Kansas City, Long Island City, Los Angeles, Milwaukee, Minneapolis, New York, Oakland, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

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AUTO MAILING LISTS, TRADE INDICES, ETC.

Card Index Directories Co., 17 Madison Ave., New York City.

BALLS AND BALL BEARINGS.

Bretz Co., J. S., 250 W. 54th St., New York City (F. & S.)

New Departure Mfg. Co., Bristol, Conn.

BATTERIES — ELECTRIC STORAGE.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

BATTERIES— VEHICLE AND IGNITION.

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York City.

Niagara Lead & Battery Co., Niagara Falls, N. Y. (Salom.)

Waite Auto Supply Co., 81 Exchange place, Providence, R. I. (Success.)

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., 7 Summer St., Worcester, Mass. (Multibestos.)

BRAKES FOR PLEASURE AND COMMERCIAL CARS.

Royal Equipment Co., The 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARS—GASOLINE PLEASURE.

Abbott Motor Co., 605 Waterloo St., Detroit, Mich. (Abbott-Detroit.)

American Motors Co., Indianapolis, Ind. (American.)

Atlas Motor Car Co., 104 Birnie Ave. Springfield, Mass. (Atlas.) **Branch:** N. E. corner Broadway and 64th St., New York City.

Berkshire Auto Car Co., Pittsfield, Mass. (Berkshire.)

Brush Runabout Co., 61st St. and Broadway, New York City. (Brush runabout, Liberty-Brush.)

Buckeye Mfg. Co., Anderson, Ind. (Lambert.)

Cameron Car Company, Beverly, Mass. (Cameron.)

Carhartt Automobile Sales Co., Detroit, Mich. (Carhartt.) **Branch:** Carhartt Bldg., 1989 Broadway, New York City.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)

Cole Motor Car Co. See Henderson Motor Sales Co.

Columbia Motor Car Co., 61st St. and Broadway, New York City. (Columbia.)

Corbin Motor Vehicle Corp., New Britain, Conn. (Corbin.)

Dayton Motor Car Co., 61st St. and Broadway, New York City. (Stoddard-Dayton.)

E-M-F Co., Detroit, Mich. (E-M-F, Flanders.)

Great Western Automobile Co., Peru, Ind. (Great Western.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Sales Co., Indianapolis, Ind. (Cole.) **Eastern Distributors:** Colt-Stratton Co., Broadway at 68th St., New York City.

Herreshoff Motor Co., 620 Harper Ave., Detroit, Mich. (Herreshoff.)

Hupp Corporation, 107 Lycaste St., Detroit, Mich. (R. C. H.)

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)

Ideal Motor Car Co., Indianapolis, Ind. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Inter-State Automobile Co., Muncie, Ind. (Inter-State.) **Branch:** 153 Massachusetts Ave., Boston, Mass.

Jackson Automobile Co., 1400 Main St., Jackson, Mich (Jackson.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.)

Lexington Motor Car Co., Connersville, Ind. (Lexington.)

Lion Motor Sales Co., Detroit, Mich. (Lion.)

Maxwell-Briscoe Motor Co., 61st St. and Broadway, New York City. (Maxwell.)

Metz Company, Waltham, Mass. (Metz.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis, Ind. (National.)

BUYERS' GUIDE---Continued

Oakland Motor Car Co., 1300 Oakland Ave., Pontiac, Mich. (Oakland.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Premier Motor Mfg. Co., Indianapolis, Ind. (Premier.)

Renault Freres Selling Branch, Broadway and 57th St., New York City (Renault.)
Branches: 1606 Michigan Ave., Chicago, Ill.; 116-120 Van Ness Ave., San Francisco, Cal.; Motor Mart, Boston, Mass.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City. (Sampson 30.)

Schacht Motor Car Co., 2808 Spring Grove Ave., Cincinnati, O. (Schacht.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Automobile Co., South Bend, Ind. (Studebaker.)

United States Motor Co., Broadway and 61st St., New York City (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

Welch Co. of Detroit, Detroit, Mich. (Welch-Detroit.)

White Co., The, 828 E. 79th St., Cleveland, O. (White.)
Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC PLEASURE.

Studebaker Automobile Co., South Bend, Ind. (Studebaker.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Brush Runabout Co., 61st St. and Broadway, New York City. (Brush.)

Cameron Car Co., Beverly, Mass. (Cameron.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Decatur Motor Car Co., Decatur, Ind. (Decatur.)
Branch: Eastern, 20 Green St., Boston, Mass.

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Moeller, H. L. & Co., New Haven, Conn. (Moeller.)
Branch: 1123 Broadway, New York City.

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Renault Freres Selling Branch, Broadway and 57th St., New York City (Renault.)
Branches: See Cars — Gasoline Pleasure.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City (Sampson.)

Schacht Motor Car Co., 2808 Spring Grove Ave., Cincinnati, O. (Schacht.)

Standard Motor Truck Co. of N. E., 9-11 Harcourt St., Boston, Mass. (McIntyre.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., Broadway and 61st St., New York City (Sampson, Brush, Stoddard.)

Universal Motor Truck Co., 510 Theodore St., Detroit, Mich. (Universal.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

Studebaker Automobile Co., South Bend, Ind. (Studebaker.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 2754 Rhode Island Ave., Detroit, Mich. (Sampson.)

Studebaker Automobile Co., South Bend, Ind. (Studebaker.)

United States Motor Co., Broadway and 61st St., New York City (Sampson.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

White Co., The, 828 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CHAINS, TIRE.

Atlas Chain Co., 34 35th St., Brooklyn, N. Y. (Atlas.)

McLain & Co., H. E., 165 Pond St., Natick, Mass.

Weed Tire Chain Grip Co., 28 Moore St., New York City (Anti-Skid.)

CHAINS — TRANSMISSION OR DRIVING.

Hoffnung & Co., S., Ltd., 118 Broad St., New York City (Coventry.)

Miller, Chas. E., 97-101 Reade St., New York City (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES — AUTOMOBILE FRICTION.

Brets Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CONNECTORS AND TERMINALS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

CYLINDER CLEANING COMPOUND.

Flash Mfg. Co., Zanesville, O.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tank for address of main office and branches.

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

HORNS—BULB, ELECTRIC, EXHAUST.

Gabriel Horn Mfg. Co., 1421 E. 40th St., Cleveland, O. (Gabriel.)

Nightingale Whistle Mfg. Co., 1770 Broadway, New York City.

Randall-Faichney Co., Boston, Mass. (Jericho.)

Sterling Machine Co., The, Norwich, Conn. (Uncas Siren.)

JACKS AND LIFTING DEVICES.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.
Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437 Vine St., Philadelphia, Penn.; 1468 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

LAMPS—HEAD, TAIL AND SIDE.

Atwood Auto Lamp Co., Park Square Motor Mart, Boston, Mass.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

LIGHTING EQUIPMENT — ELECTRIC.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

Esterline Company, The, La Fayette, Ind. (Matchless.)
Branches: Detroit, Mich.; San Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 810½ Chapel St., New Haven, Conn.

BUYERS' GUIDE---Continued

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York City.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 44 Power Ave., Cleveland, O.

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.

Branches: 119-121 E. 24th St., Chicago, Ill.; 878 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Bretz Co., J. S., 250 W. 54th St., New York City (U. & H.)

Connecticut Telephone & Electric Co., 10 Britannia St., Meriden, Conn.

Branches: 819-A Boylston St., Boston, Mass.; 1783 Broadway, New York City; 1146 Michigan Ave., Chicago, Ill.; 544 Van Ness Ave., San Francisco, Cal.; 1518 Broadway, Denver, Col.; 510-511 Majestic Bldg., Detroit, Mich.; 12 So. Eighth St., Minneapolis, Minn.

Heinze Electric Co., Lowell, Mass. (Heinze.)

Herz & Co., 295 Lafayette St., New York City (Herz.)

K-W Ignition Co., The, 44 Power Ave., Cleveland, O.

Marburg Bros., 1777 Broadway, New York City (Mea.)

Simms Magneto Co., 1780 Broadway, New York City.

Branches: London and Paris.

Splitdorf, C. F., Walton Ave. and 138th St., New York City.

Branches: 1679 Broadway, New York City; 319 Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 520 Van Ness Ave., San Francisco, Cal.; 868 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MOTORCYCLES AND MOTORCYCLE SUPPLIES.

American F. N. Co., Boston (F. N.)

Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Hendee Mfg. Co., Springfield, Mass. (Indian.)

Branches: 1251 Michigan Blvd., Chicago, Ill.; 234 Van Ness Ave., San Francisco, Cal.; 178 Gt. Portland St., London, Eng.

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

International Automobile Association, Shelden M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Western Motor Co., Marion, Ind. (Rutenber.)

OILS, GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)

Branches: Boston, Mass.; Fall River, Mass.: Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)

Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.)

Branch: 66 Wabash Ave., Chicago.

Havoline Oil Co., 133 William St., New York City (Havoline.)

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)

Branch: 284 Columbus Ave., Boston, Mass.

Kincaid Oil Co., 219-221 West Exchange St., Providence, R. I. (Kincaid.)

Miller, Chas. E., 97-101 Reade St., New York City (Pan-American.)

Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York City (Monogram.)

Branches: 126 Massachusetts Ave., Boston, Mass.; 423 Passaic Ave., East Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)

Branches: In all cities.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., 80 Broad St., New York City (Wolverine.)

Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.; 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE GUNS.

Randall-Faichney Co., Boston, Mass. (B-Line.)

PUMPS—HAND AND ENGINE OPERATED.

Bridgeport Brass Co., 124 Crescent St., Bridgeport, Conn. (Atlas.)

RIMS — REMOVABLE AND DETACHABLE.

Firestone Tire & Rubber Co., Akron, O.

Branches: In all principal cities.

Fisk Rubber Co., Chicopee Falls, Mass.

Branches: Boston, Mass.; Springfield, Mass.; New York City, Philadelphia, Penn.; Atlanta, Ga.; Buffalo, N. Y.; Cleveland, O.; Detroit, Mich.; Chicago, Ill.; St. Louis, Mo.; Minneapolis, Minn.; St. Paul, Minn.; Kansas City, Mo.; Denver, Col.; Seattle, Wash.: Los Angeles, Cal,; San Francisco, Cal.; Providence, R. I.; Hartford, Conn.

Jordan Demountable Rim Co., 733 Boylston St., Boston, Mass.

Michelin Tire Co., Milltown, N. J.

Branches: Boston, Mass.; Buffalo, N. Y.; New York City; Philadelphia, Penn.; Cleveland, O.; Chicago, Ill.; Detroit, Mich.; Denver, Col.; San Francisco, Cal.; Seattle, Wash.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)

Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)

Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Connecticut Shock Absorber Co., 10 Britannia St., Meriden, Conn.

Branches: 819-A Boylston St., Boston, Mass.; 1783 Broadway, New York City; 1146 Michigan Ave., Chicago, Ill.; 544 Van Ness Ave., San Francisco, Cal.; 1518 Broadway, Denver, Col.; 510-511 Majestic Bldg., Detroit, Mich.; 12 So. Eighth St., Minneapolis, Minn.

Gabriel Horn Mfg. Co., 1421 E. 40th St., Cleveland, O. (Foster.)

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)

Branches: See Jacks and Lifting Devices.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Westen Mfg. Co., 289 Halsey St., Newark, N. J.

SOAPS.

Hopewell Brothes, Newton, Mass. (Paos.)

Branch: 1974 Broadway, New York City.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.

Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Herz & Co., 295 Lafayette St., New York City (Bougie Mercedes.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Lucas & Co., Brookline, Mass. (Sta-Rite.)

Mosler & Co., A. R., 163 W. 29th St., New York City (Spit Fire.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.

Branches: See Magnetos and Magneto Supplies.

Walker Machine Co., G. A., 51 Chardon St., Boston, Mass. (Ballite.)

SPEEDOMETERS AND RECORDING DEVICES.

Casgrain Speedometer Co., 172 Columbus Ave., Boston, Mass.

Branches: 1919 Broadway, New York City; 2031 Euclid Ave., Cleveland, O.

Jones Speedometer, New Rochelle, N. Y.

Branches: 1340 Michigan Ave., Chicago, Ill.; 109 Massachusetts Ave., Boston, Mass.; 1409 Vine St., Philadelphia, Penn.

Stewart & Clark Mfg. Co., 514 Diversey Boulevard, Chicago, Ill. (Stewart.)

Branches: New York City and Detroit, Mich.

(Continued on Page 48.)

THE ACCESSORY —AND— GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. I. PAWTUCKET, R. I., NOVEMBER, 1911 No. 1

COMING SHOWS AND THOSE DIRECTING THEM.

Four Great Exhibitions, Each to Continue Two Weeks, With Equal Periods Devoted to Pleasure and Industrial Vehicles, Are Organized for New York, Chicago and Boston.

THE annual national exhibitions of motor cars to be held in New York, Chicago and Boston, always large and imposing, will be larger and more complete than ever before. In preparation for these displays the manufacfurers having space for exhibit are producing special machines and the latest refinements in body design. The shows will have a different tone than in previous years. Stock products will be shown, but more than ordinary attention will be directed toward specialization of the pleasure vehicles. This distinction, however, will not be noticeable as regards the industrial transports. The machines will be typical of the highest mechanical development and there will be exploitation of construction designed for special service, for it is realized that there is a demand of almost unlimited proportions with variance for almost every individual requirement.

Col. George Pope of Automobile Board of Trade Show Committee.

The exhibitions will be more extensive than ever before, from realization of the transitory condition of the industry and the endeavors of the builders to make adaptations to the additional needs. The shows will have a different aspect from the viewpoint of the agent, and visitors will be impelled by business motives rather than by curiosity or by social ambitions.

Naturally the show that has an unusual measure of attractiveness from the fact that it is located in the commercial centre of the nation will take place at Madison Square Garden, New York, beginning Jan. 6, under the direction of the Automobile Board of Trade, and will be continued for two weeks, the display to be begun Jan. 15 to be of industrial wagons only. During this entire period there will be exhibition by the Motor & Accessory Manufacturers. The show committee is Col. George Pope, Alfred Reeves and Merle L. Downs.

The second exhibition will be at the Coliseum and the First Regiment armory at Chicago under the direction of the National Association of Automobile Manufacturers and the management of S. A. Miles. At this show there will be practically the same exhibits of cars as will be seen at New York, and the pleasure vehicles will be seen the first week, beginning Jan. 27, and the second week, beginning Feb. 3, there will be the power wagon display. The exhibitors of accessories will be much the same as will be seen at New York.

The annual Boston show, which is always the largest in America, will be in two periods, the first for pleasure cars, to be begun March 2 and concluding March 10, and the second for industrial wagons, to be begun March 13 and ended March 20. This will be somewhat at variance with the conditions obtaining with the other shows in that the exhibits will in many instances be made in the names of the agents, but the accessories will be practically the same as at New York and Chicago. This will be under the general management of Chester I. Campbell.

Obviously there will be at all of these shows displays of accessories made for but one week, and very generally there will be a sufficient number of withdrawals so that all of the members of the Motor & Accessory Manufacturers, Inc., may make display.

The fact that Madison Square Garden is not large enough to meet the requirements of those who would show machines brought about the organization of a second metropolitan show, this under the direction of the National Association of Automobile Manufacturers, which organization has been for years the moving spirit of the Chicago exposition. This show will be made at the Grand Central Palace, the new structure which will be utilized for an exhibition of this character for the first time, and which will be under the direction of S. A. Miles.

This Grand Central Palace show will be large and it will not suffer by comparison with the Madison Square Garden exhibition. The date for this will be Jan. 10-17, inclusive. It will differ with the Madison Square Garden show in that both pleasure and industrial machines will be shown.

COL. GEORGE POPE.

Col. George Pope of the show committee of the Automobile Board of Trade, formerly treasurer of the show committees of the Association of Licensed Automobile Manufacturers, has probably been more closely and longer identified with these committees than has any other man. The financial administration of the exhibitions has always been the work assigned to Col. Pope, whose judgment has been regarded as an important factor in the conduct of the shows. Col. Pope has for years been treasurer of the Pope Manufacturing Company and other large interests, and he has been identified with the automobile industry since its transition from the production of the bicycle. Incidentally, so far as the motoring world is concerned, Col. Pope is also associated with a number of manufacturing enterprises more or less allied with motor vehicle production.

The prestige of former exhibitions, all of which have been successful from every point of view, is one reason for keen anticipation by the industry of the coming show, and, it being in all probability the last that will be held at Madison Square Garden, it is regarded with a considerable degree of sentiment, aside from its value commercially. And naturally the display is looked forward to as certain of being very productive. For the success of the display much dependence is placed upon the committee and the energy and resourcefulness of its members.

From Left to Right: Samuel A. Miles, Directing Grand Central Palace and Chicago Exhibits; Alfred Reeves, Member Automobile Board of Trade Show Committee; Chester I. Campbell, General Manager Boston Display.

SAMUEL A. MILES.

The exhibitions at Chicago have been generally conducted under the direction of the National Association of Automobile Manufacturers, and supervision of Samuel A. Miles, and he will again manage the forthcoming show in the Windy City. Mr. Miles however, who has had some experience with metropolitan displays, will also direct the exhibition to be made at the Grand Central Palace, this making him the executive of shows in the two largest cities of the country. Mr. Miles has been general manager for the National Association of Automobile Manufacturers and with his experience with previous displays and his knowledge of the industry there is expectancy that the shows under his supervision will this season surpass all previous expositions. The Chicago shows for several years have been held in two separate buildings, and with two weeks for the exhibition to come, the direction of it presents problems that are unusually complex. Mr. Miles believes that the Chicago show will be the largest from every point of view and the most productive in the history of the organization. The only limitation is lack of space to meet the demands.

CHESTER I. CAMPBELL.

Every exhibition of motor cars made by the organized agents and dealers in Boston has been with the supervision of Chester I. Campbell, secretary of the Boston Automobile Dealers' Association. The first show organized by the trade, Mr. Campbell was secretary of the show committee and he continued as such until he was made general manager and placed as executive of the organization which required all of his time and attention, for there is no more notable exhibition than that which is to be seen at Mechanics' Hall building. Mr. Campbell gained his initial experience as manager of bicycle shows and when he took up the Boston organization it was with a purpose of making it a buyers' exhibition. The result has been that it is expected to develop more business with private owners than any other held in America. Each year the Boston show has been charming from the point of decoration and Mr. Campbell has always created what has been appropriate, artistic and effective as a setting for the cars. It is expected that Mr. Campbell will produce what will be in keeping with past exhibitions and be even more pleasing and interesting. Mr. Campbell has always been burdened with applications for more space than he has been able to grant. The coming show will be somewhat relieved by the division of the cars, but both departments will be full and complete.

ALFRED REEVES.

Alfred Reeves, sales manager of the United States Motor Company, formerly general manager for the Association of Licensed Automobile Manufacturers, and of the American Motor Car Manufacturers' Association, is associated with Col. Pope and Mr. Downs in the show committee of the Automobile Board of Trade. Mr. Reeves was the executive of the exhibition organization which conducted the majority of the displays at the Grand Central Palace until the dissolution of the American Motor Car Manufacturers' Association, and later with the licensed group of manufacturers, and his knowledge of the trade and industry and the requirements of the people who support motor vehicle shows has been especially valuable in the preparations making for the Madison Square Garden exhibition. Mr. Reeves has been exceedingly successful in whatever he has undertaken and with his experience and associates there is abundant reason to believe that the coming exhibition will be the most successful that has ever been held in the historic arena.

MERLE LEACH DOWNS.

Merle L. Downs, Secretary of the Show Committee of Automobile Board of Trade.

The man most experienced with the conduct of metropolitan motor vehicle shows is Merle Leach Downs, secretary of the show committee of the Automobile Board of Trade, which organization succeeded the Association of Licensed Automobile Manufacturers. Mr. Downs was a member of show committees of the old body and was associated with the majority of the organizations conducting the Madison Square Garden exhibitions as committeeman or secretary. His knowledge of the trade is intimate and his experience in a secretarial capacity with the shows has specially qualified him for the position he now holds. Mr. Downs entered the industry in November, 1899, and during the past dozen years has been identified practically with one concern, save during the time he was associated with the executive staff of the Association of Licensed Automobile Manufacturers. One of the reasons for the success of the Madison Square Garden exhibitions has been the admirable organization controlling them, the preparations being made so thoroughly and carefully that each has been more satisfactory and complete than that immediately preceding it. As secretary of the show committees for several years Mr. Downs has been largely responsible for these results.

The new plant of the Herreshoff Manufacturing Company in Woodward avenue, between Belmont and Trowbridge avenues, Detroit, Mich., is so far advanced that it will be started with its complete facilities about Dec. 15. This plant is exceptionally well planned and in many respects is model, this applying to design, lighting, heating, ventilating and other details essential to fullest production.

The American Automobile Manufacturing Company, New Albany, Ind., is planning increased facilities for the continuation of its present line of pleasure cars and for the construction of several models of light and heavy power wagons. George H. Wilson of Louisville, Ky., has succeeded Berton B. Bales as president of the company.

The new factory of the Victor Motor Truck Company, near the tracks of the New York Central railroad, at Buffalo, N. Y., was ready for occupancy Nov. 1, the company having made preparations to vacate the building in Niagara street that has been utilized since its organization. The equipment of the new plant is very complete.

DeLISSER RECEIVES TESTIMONIAL.

Horace DeLisser, Vice President United States Motor Company

In appreciation of his excellent work, up-building the Ajax-Grieb Rubber Company, Trenton, N. J., maker of Ajax tires, as well as his personal interest in all the employes, the directors and department heads of that concern recently tendered a dinner to Horace De Lisser, formerly president of the company and now vice president of the United States Motor Company. During the evening a handsome gold watch was presented to Mr. DeLisser by President William Grieb of the Ajax concern, on behalf of the employes of his company. Among those present, besides the guest of honor were: Benjamin Briscoe, Frank Briscoe, R. A. Pattison, J. C. Matlock, R. DeLisser, Louis P. Destribats, Harold W. Simpson and Samuel E. A. Stern.

The new buildings which will increase the capacity of the Ford Motor Company, Detroit, Mich., practically 100 per cent. will be completed by the first of December unless unexpected delay eventuates.

The Lord Baltimore Motor Car Company, Baltimore, Md., has under consideration a proposal to remove its factory to York, Penn.

The Howard Automobile Company, Jackson, Mich., has perfected plans to remove its factory to Macon, Ga., where a $200,000 plant is being erected for its occupancy.

The Hupp Corporation is building a new factory and power house at Lycaste street near the Michigan Central railroad, Detroit, and work is being rushed to close the structures before cold weather.

A one-story factory is building at Cedar Rapids, Ia., which will be utilized by the Hawkeye Auto & Carriage Company, a corporation organized by W. Morgan, D. Stofflet and G. C. Schneider, to build trucks from designs by Mr. Schneider that are to have several original features.

The Lion Motor Car Company, Adrian, Mich., has purchased land adjacent to its factory and purposes to erect buildings to increase its manufacturing facilities so that it may produce from 1000 to 1500 cars for 1912 if conditions justify such production.

A property of seven acres has been purchased by the Hupp Motor Car Company at Mount Elliott and Milwaukee avenues, Detroit, Mich., and plans are making for the construction of a factory that will increase the capacity of the present factory 200 per cent.

The Hudson Motor Car Company has begun building a steel and concrete two-story structure 530 by 60 feet, which will give 63,600 square feet of floor space, in connection with the factory in Jefferson avenue, Detroit, Mich. The work will be completed by the first of the year.

SAMUEL McKNIGHT BUTLER.

The automobile industry would be remiss indeed if it failed to realize the loss sustained in the death of Samuel McKnight Butler, chairman of the contest board of the American Automobile Association. None but those who have attempted to administer the laws of sport can conceive the burden that such a position entails, particularly in motoring, where features of trade enter into the consideration of every problem. Mr. Butler filled the office with credit to himself and the conflicting interests which he served.

A graduate from the bicycle ranks, he became one of the organizers of the Automobile Club of America, being at first its assistant secretary and later secretary for 10 years. He also was secretary of the first automobile trade association, formed some 11 years ago. His connection with the former club was such that his remarkable ability in organizing and promoting various shows and contests was brought into play. When the Manufacturers' Contest Association formed an alliance with the American Automobile Association in the matter of conducting motor car races and other contests, Mr. Butler left the Automobile Club to become chairman of the contest board. This was two years ago, and since that time he had had much to do with formulating the rules and regulations which governed this phase of the industry. In filling this office, he performed his task with rare good judgment, and assisted materially in the advancement of true sportsmanship, not forgetting the best interests of all concerned. He deserves the grateful remembrance of a wide circle of friends, who will mourn his death as untimely, particularly as his work had not been completed, fully. His place will be hard to fill.

The Late S. M. Butler.

Mr. Butler was born in Camden, N. J., Dec. 30, 1866. He was a veteran of the Spanish War, having served in the Signal Corps. He was interested greatly in the science of aerial navigation and in November, 1906, made a balloon flight from Pittsfield, Mass., to Long Island Sound. During the international aviation meet at Belmont Park, Long Island, in 1910, he served as one of the officials, representing the Aero Club of America, of which he was a member. His home was in Brooklyn, N. Y., where he is survived by a widow and two daughters.

L. H. Morrison, formerly of Indianapolis, Ind., is at the head of an American syndicate that is negotiating for a site for a motor car factory to be established either at the City of Mexico or Monterey, Mexico.

A steel and brick building for a stock and assembling room is being erected in connection with the plant of the J. I. Case Threshing Machine Company at Racine, Wis., which will be ready for occupancy early in the new year.

The Wichita Machine Company, Wichita Falls, Tex., is equipping a factory in that town for the building of power wagons.

The property of the Schurmeier Motor Company at St. Paul, Minn., has been purchased by H. H. Bigelow for $41,000, this being an investment only. No disposition of the plant has as yet been made.

A property at Grosse Pointe, Mich., with frontage of 283 feet, has been purchased by Howard E. Coffyn, president of the Hudson Motor Car Company, for a price said to be $40,000. The utilization of the property has not been announced.

A five-ton truck is to be built by the Teel Manufacturing Company, Medford, Mass., a concern that has been well known for years as a manufacturer of tops and wagon specialties. The machine will be known as the Teel.

A three-story and basement building 758 by 78 feet is to be erected by the Olds Motor Works, Lansing, Mich., which is to be used for assembling purposes, and which will increase the capacity of the plant about 50 per cent.

The motor department of the Corbitt Buggy Company, Henderson, N. C., has been taken over by the Corbitt Automobile Company, which has been organized with capital of $200,000, and which will produce pleasure cars.

The Lippard-Stewart Motor Car Company is now located in the plant at Buffalo, N. Y., formerly used by the Thomas Taxicab Company. The Lippard-Stewart company builds power wagons of 1500 pounds capacity for delivery and municipal department service.

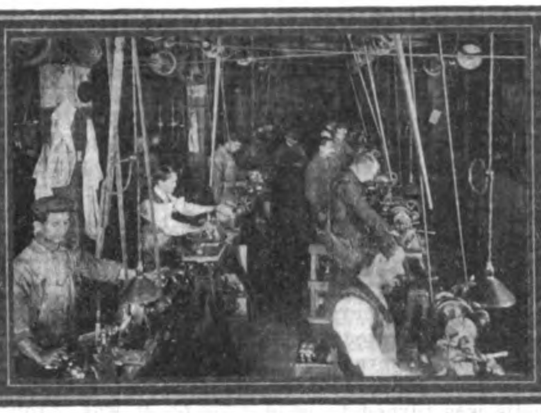
A factory that is planned to have a manufacturing capacity of 3000 cars a year is to be built on a site purchased at Windsor, Ont., by the Hupp Motor Car Company of Detroit, Mich., work having already begun. The production of this plant will supply the Canadian trade.

The Lockwood-Ash Motor Company, Jackson, Mich., has acquired the Never-Miss Spark Plug Company, Lansing, Mich., and will remove the plant to Jackson, where a new factory, 80 by 80 feet, of two stories, will be occupied. The head of the concern is W. L. Ash, for eight years executive of the Never-Miss Spark Plug Company.

The four-story 400 by 300 feet concrete addition to the plant of the Willys-Overland Company at Toledo, O., is well along toward completion, but this large increase in manufacturing facilities will not cause the removal of the Indianapolis factory to Toledo. This transfer will not take place for a considerable length of time, although consolidation is the policy of the company.

Power wagons will be built by the Schacht Motor Company, Cincinnati, O., in the Tilden-Jackson Typewriter Company's plant at Hamilton, Ont. A Canadian company has been organized to conduct the business, of which Thomas P. Rolph, Toronto, is president; T. H. Schacht, Cincinnati, vice president; Gerard Muntz, Toronto, treasurer, and J. S. Innes, Toronto, secretary and sales manager.

A model factory in every essential is to be built by the Kline Motor Car Company on a tract of 15 acres of land at Richmond, Va., recently purchased. The property will have spur track facilities for shipping and receiving. The entire machine equipment will be removed from the present factory at York, Penn. Work will shortly be begun on the new buildings.



MAGNETO MANUFACTURE A SCIENTIFIC PROCESS

Study of Methods in a Leading American Factory Discloses Interesting Operations Incidental to Producing These Instruments in Quantities. Improved Processes Make Large Output Possible Without Sacrificing Quality of Product.

BY

VICTOR W. PAGE, M. E.

The reader of motoring subjects often considers the modern motor car in its entirety, but those more familiar with progress made in automobile construction know the mechanism is an assemblage of many distinct components, each of which represents the endeavors of different engineers and designers seldom considered in connection with creating the complete vehicle. While many manufacturers claim to construct the car entirely in their own shops, there is a tacit understanding in the industry that some components can be purchased from specialists in their production much cheaper than the motor car builder could construct them, even if possessed of the highly specialized skill and experience necessary to create and manufacture the various parts successfully.

The progress in motor car development for several years has been mainly in refining the details and accessory components, as the internal combustion engine, reflected in the forms in use for some time, may be justly regarded as having reached a point of practical serviceability, and the recent types may be said to incorporate practically all of the features desirable. The greatest progress has been made in developing the auxiliary components of the engine, and only one who is fully conversant with the vagaries of gasoline motors can appreciate the importance of having these very necessary groups function properly. Among the adjuncts used in connection with a hydrocarbon engine, there is none that has more important bearing than the ignition system, and the decrease in efficiency which follows when inefficient or imperfect electrical apparatus is employed is too well known to require comment.

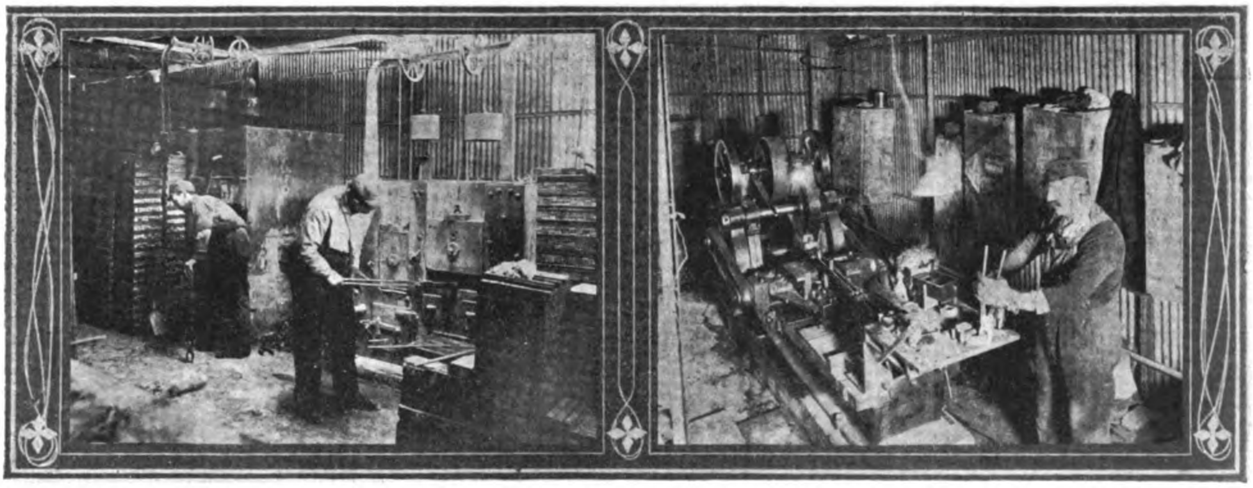
One of the most important steps in developing the practical and efficient internal combustion power plant has been the general adoption of magneto energy as a source of ignition, greatly simplifying the apparatus necessary to fire the charge in the engine cylinders. The advantages of magneto current production have been dwelt upon at length in previous issues of our publications, and may be summed up easily in very few words. The ignition is positive and unfailing; the intensity of the spark remains always the same, regardless of length of service; the apparatus is extremely simple and reliable and in the case of a multiple cylinder engine, the spark timing is synchronous in all cylinders. This makes for easier running, better balance and economical operation. That these advantages are now well recognized is best exemplified by the general use of this device even by people who have previously looked upon it with suspicion.

Many firms are engaged in producing magnetos and a number have attained an enviable reputation for excellence of product, but the average motorist seldom appreciates the magnitude of the industries thus employed, or the equipment and careful processes necessary to insure accuracy of finish coupled with quantity production. To properly understand the completeness of the equipment and the splendid facilities that obtain for the rapid and accurate production of interchangeable parts, one should visit a representative manufactory engaged in making such apparatus.

Among the pioneer makers of complete ignition systems, the firm of C. F. Splitdorf, operating several factories in New York City, is prominent, and it has manufactured electric apparatus for so many years that the product is regarded as standard. The magneto developed by this company has a very wide sale all over the world, and is produced in very large quantities, so a review of the methods in vogue at this complete and representative manufactory cannot fail to give the motorist a better understanding of the many steps necessary to produce an enduring and efficient device.

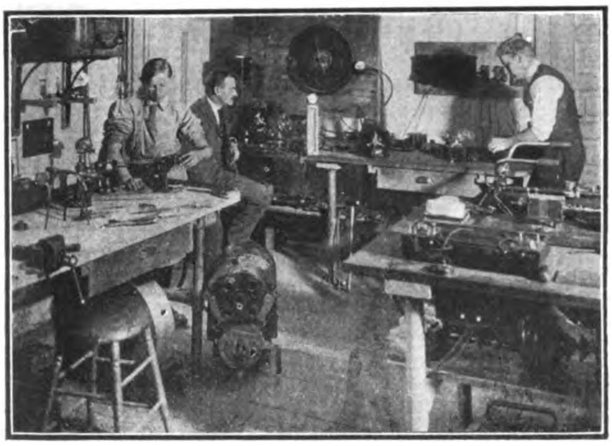
Modern Manufacturing Methods Insure Quality.

The value of systematic production in insuring uniformity of product is well recognized by engineers, though it is not always apparent to the layman, and



To Form the Magnets, Straight Bars Cut to Proper Length Are Heated in Furnaces Shown at Left, and Bent When Proper Temperature Is Reached, in Powerful Forming Press Known as "Bulldoser," Depicted at Right.

in no plant producing the same character of devices is this better exemplified than in the factory under discussion. A mechanic passing through the plant would appreciate the improved processes of machining components, and the special fixtures and gauges that insure the production of accurately finished parts in quantities. The number of operations through which the pieces must pass is not readily grasped by those without mechanical training, and the casual observer would be apt to think that some of the many inspections or niceties in machine work were unnecessary. On more careful consideration it will be apparent that every examination, while increasing the manufacturing cost, is positive assurance of excellence of product. The writer was very favorably impressed with the manufacturing system prevailing at this plant, the careful workmanship and thorough oversight making clear the enviable reputation and satisfactory service of the product.


Well Equipped Experimental Room in Which Splitdorf Ignition Devices Are Perfected Before Marketing.

New as the factory and equipment are, the Splitdorf laboratory is one of the real pioneers of the automobile industry. It was founded in 1858 by Henry Splitdorf, the father of the present manager, to carry on experiments connected with projected improvements in telegraph instruments. The great problem in those days was to reduce the time required in sending messages long distances. This Henry Splitdorf accomplished by inventing a repeating relay that eliminated the older method of having operators repeat the messages every few miles, and the time consumed in transmitting a message from New York to Chicago was reduced from five hours to as many minutes. As the Western Union Telegraph Company needed a large number of these instruments, a factory was established and the manufacture was continued for several years.

How Factory Was Started.

When the Roentgen or X-rays were first discovered, the manufacture of Rhumkorf coils, which are the same in principle as those at present used for ignition, was started and many were sold to the medical profession and experimenters. The requirements of the first electric ignition systems of the high-tension type were the same; a high potential current must be utilized to ignite the charge in the cylinder of the gas engine, and the simplest method of obtaining it was to use a transformer of the "step up" type and change direct current of comparatively low voltage, such as generated by small dynamos or chemical batteries, to alternating impulses of higher potential. The experience obtained in building the larger X-ray coils was turned to good account, it was through the wide distribution of the Splitdorf ignition coils that the name became so well known.

Tester Determining Strength of Finished Magnets Before Sending to Assembling Room.

From this small beginning, the present enormous business expanded as the automobile industry grew stronger. In 1885, Charles Splitdorf assumed the management of the business which the founder relinquished because of advancing years, and the firm was soon forced to expand to satisfy the demand existing for the ignition coils. In 1889, the younger son, John, became interested in the business and the laboratory at 17 Vandewater street was established. It continued at this location until 1907, when, having greatly outgrown its quarters, the entire establishment was removed to a splendid new building at 261-265 Walton avenue, the Bronx. The constantly in-

After Magnets Are Formed, the Ends, Sides and Inner Faces Are Ground to Fit Pole Piece Assembly as Shown at Left; When Machining Is Complete, and After Hardening, the U Bars Are Magnetised in Solenoids, Outlined at Right.

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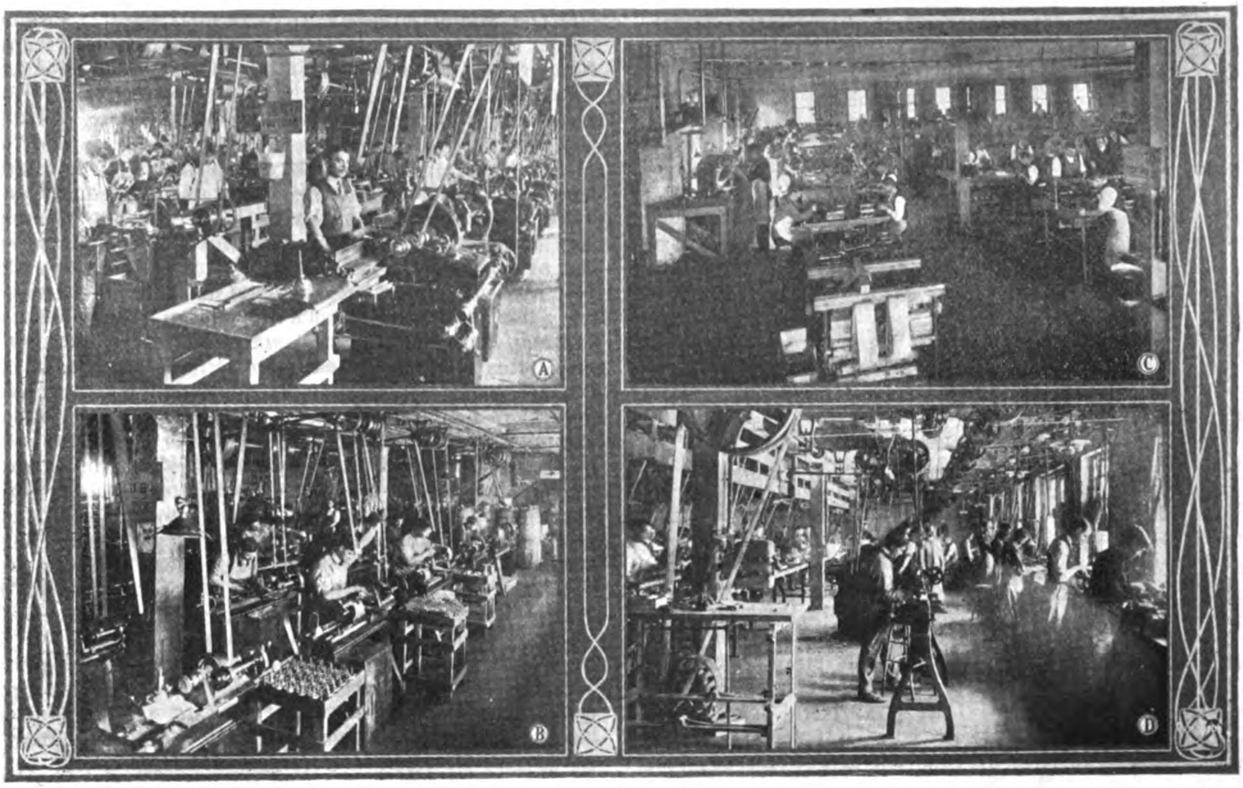
creasing business has rendered even this great plant inadequate to supply the demand and to this end, a large factory was secured for an overflow. The largest plant is devoted exclusively to magneto production, the other establishments are used to manufacture the smaller ignition specialties, such as coils, switches, timers, plugs, etc., and for offices and experimental work.

Producing Components in Quantity.

It is not possible to go into details regarding many interesting processes to be seen at this factory as lack of space prevents a complete exposition of manufacturing methods. The writer will mention only those steps that interest the lay reader, and some of the most important operations are made clearer by the very complete set of illustrations accompanying this article.

The arrangement of the building, which is of six stories and basement, is such that the heavier machinery is on the lower floors, the finishing and testing being carried on with lighter machinery on the upper ones. The progression of the raw material, which enters the factory at the basement, is the same as in all modern manufacturing establishments, the endeavor being to minimize the number of handlings, and to reduce the stock to small pieces or finished components as quickly as possible.



Busy Rooms at Splitdorf Plant—A, Grinding Machinery; B, Gear Cutting Department; C, Assembling and Testing Floor; D, Where Ball Bearing Races are Produced.

All stock entering into the construction of the Splitdorf product is of domestic origin, and the magneto is said to be a strictly all American product. It is manufactured in its entirety at the plant of the company, which is making everything, even to the ball bearings, a component usually produced by specialists.

All materials are carefully tested and inspected on receipt and the rough stock room contains tons of material in many forms and for many uses. One sees steel and brass rods, copper and iron wire, aluminum, copper, brass and iron sheets, castings of aluminum, iron and bronze and bins filled with small rubber composition parts or stampings ready for machining. To insure uniformity of product and to see that the material possesses the required qualities, samples are selected from every lot received and subjected to exhaustive tests to determine if the chemical composition and physical properties conform to the high standard established.

In the tour of the various departments many interesting and distinctive processes were noted, a large part of these having been originated by the engineering department of the company, and shown the writer only in strict confidence. Many thousands of dollars are invested in special jigs and templates and some of the machinery used has been produced in the tool shop at a great expense, and after much experimentation.

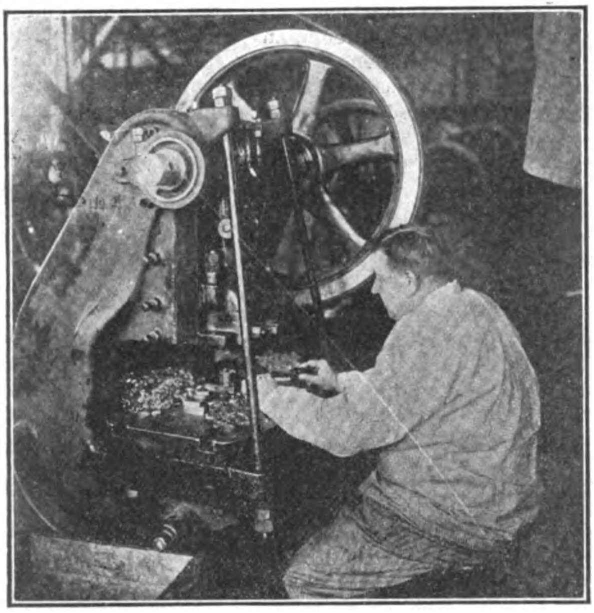
Machine Tool Equipment Very Complete.

As is true of other mechanisms, the modern magneto is composed of a large number of distinct parts, the production of which involves considerable labor. Some of these must pass through many processes before assembling. All of the power tool equipment is by the best makers and the accuracy and finish of the work turned out cannot be excelled. Screw machines and turret lathes are as common as engine lathes in the average factory. Grinders, milling and gear cutting machinery and hundreds of engine lathes are also employed in the various departments to machine the parts. The lathe equipment is most complete, ranging from the small jeweller's bench lathes, in which the small ball bearing races are ground, to the massive turrets and automatic screw machines. Multiple spindle, sensitive and back geared drill presses are seen in infinite variety, as well as boring machines and special machine tools developed to meet the specific conditions existing at this plant.

If a part can be produced more accurately or at less expense with a special machine or fixture, this is immediately constructed, and many machines, when once set to perform a certain operation are never changed to other work. High speed tool steel is used throughout for all machines and while cutters of this material are expensive, it is possible to remove more material a unit time than with the ordinary tool steels, and tools of this material keep their edges longer. All tools are under constant supervision and the finished parts are carefully inspected to make sure that neither the tool nor the template is worn enough to introduce an element of error.

Thousands of Parts Needed Daily.

As an example showing the completeness of the equipment, all of the many small screws used are manufactured from the bar by automatic screw machines of the latest pattern, some of which produce as high as 6000 of these small components daily without any other attention than renewing the bars of metal and keeping the tools in condition to do their work accurately.



Power Presses Produce Hundreds of Small Parts Direct from Sheet Metal.

In the construction of ignition appliances, many small parts are employed that can be formed from the sheet, and for this work, there are power presses that stamp them out as fast as the stock can be fed between the hub and die employed to form them. By changing the shape of the dies employed many different parts can be made on these machines, these replacing parts formerly produced by casting, making for lighter, cheaper and simpler construction.

The number of small parts used cannot be appreciated by those not versed mechanically, but as an example, in such a relatively simple device as a magneto or battery switch there may be nearly 35 distinct pieces in the assembly. The even simpler contact breaker housing cover has 12 distinct pieces. The importance of producing these small parts in quantity, but at the same time accurately, cannot be overestimated, and it is only by constant attention and close inspection that uniformity of production is realized.

Arrangement of Departments.

The various departments of the Splitdorf factory are well arranged and the different processes take place in a logical order. In the basement, the magnets are made, machined and magnetized. The screw machinery is on the first floor; some of the heavier boring and milling machinery is on the second; the medium weight machine tools used in gear cutting, turning and armature finishing are on the third. Armature winding and grinding machinery is not under heavy stress, and is installed on the fourth story. Above this, the various processes incidental to ball bearing manufacture and some light grinding are carried on, while the top, or sixth floor, is devoted to assembling the various components produced in the other departments, and testing the finished product.

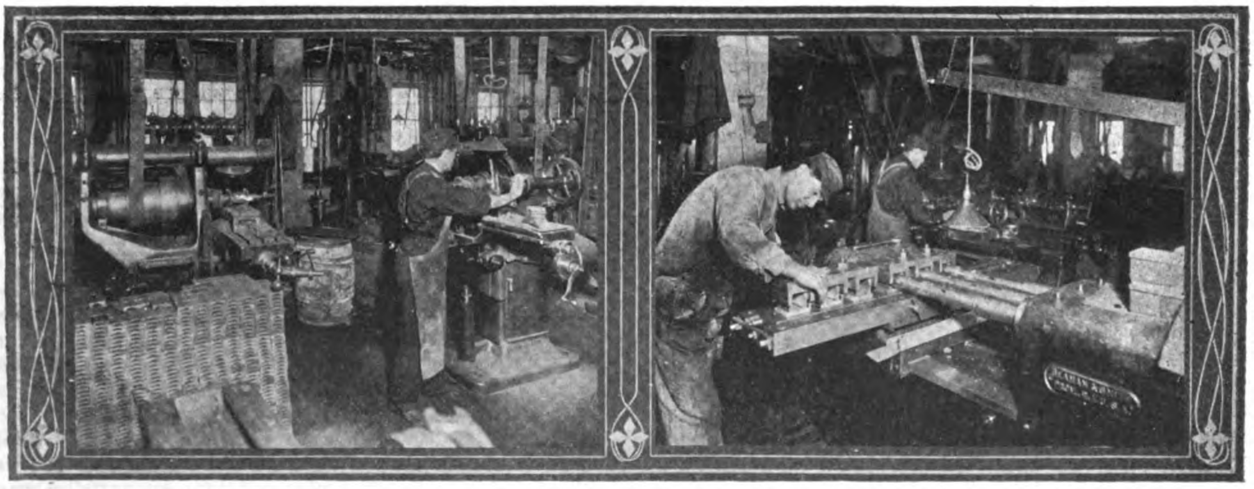
How the Various Parts Are Made.

A magneto may be divided into a number of groups, these varying with the type of instrument. For convenience, we will divide the Splitdorf magneto into the following assemblies: (a) The magnets, (b) the base assembly, including the pole pieces, the bearing ends and the base plate; (c) the armature, (d) the contact breaker, (e) the distributor. Besides these, there are other parts necessary to proper current production, the most important element being the transformer coil with which is incorporated the switch assembly, and the spark plugs which make possible the utilization of the spark in the cylinders.

The magnets are a very important part of any magneto, and it is largely upon their strength and endurance that the capacity of the instrument depends. The base piece serves to carry the bearings in which the armature revolves, as well as the pole pieces to which the magnets are fastened, and between which the armature revolves. The armature group includes the shaft, the core around which the wire is wound, the distributor speed reduction driving gear, and the timing cam. The contact breaker includes the housing, the insulated platinum contact screw and the grounded contact lever, which carries the other contact point and which is operated by the timing cam on the armature shaft. The distributor assembly comprises the collecting and distributing brushes, the large distributor speed reduction gear, the distributing segment, the distributor shaft and its bearings, and the high-tension terminals from which the current is led to the cylinders.

Magnet Making Exacting Process.

Considering first the process of making magnets, one of the most interesting involved in magneto production, one can form some idea of the amount of work involved in making even such a relatively simple part as a horseshoe magnet. The bars of special steel



Pole Pieces of Cast Iron Are Finished on Two Sides and Outer Face in One Operation with Multiple Milling Cutters as Depicted at Left; the Special Machine Utilised in Boring Three Base Assemblies Simultaneously Is Clearly Shown at Right.

are first cut in heavy shearing machines to the required length, and then taken to the forming room, where they are placed in large Brown & Sharpe coal burning furnaces to heat them prior to forming. The temperature of these furnaces is maintained at a uniform point by careful stoking, the degree of heat being easily determined by pyrometer indication.

After the bars have been heated to the desired degree, they are removed from the furnace and placed in the "bulldozer." This is a large horizontal forming press, consisting of a movable member reciprocated by heavy cranks moved by large gears. At the end of these the male member of the forming tool is carried, while the female member or die is attached to the bed of the machine. When the bars are properly placed, being fed up to a gauge, the power is turned on and the sliding frame carrying the hub drives the bars into the die, which is shaped like the outside of a magnet, while the hub conforms to the inside contour. Two magnets are formed at the same time; one inside and one outside member. After the bent bars are removed from the die, and while still hot they are placed between the jaws of a clamp at the end of the machine, where the ends are bent in slightly. The magnets, which are still at a high temperature, are placed in and covered with lime to cool, the object being to reduce the heat slowly and thus avoid air hardening.

After cooling the magnets are allowed to age for a certain time, and are then machined. This involves drilling the holes in the sides for taking the screws by which the magnets are attached to the base assembly, and grinding the ends, sides and inner faces so they will fit closely against the pole pieces without air space to reduce the intensity of the magnetic energy passing from the magnet to the pole members. When the bent bars have been machined, they are hardened prior to becoming magnetized, because hard steel remains magnetized longer than soft metal, and the capacity and endurance of the magneto depends largely upon the degree of retentivity the hard steel has acquired.

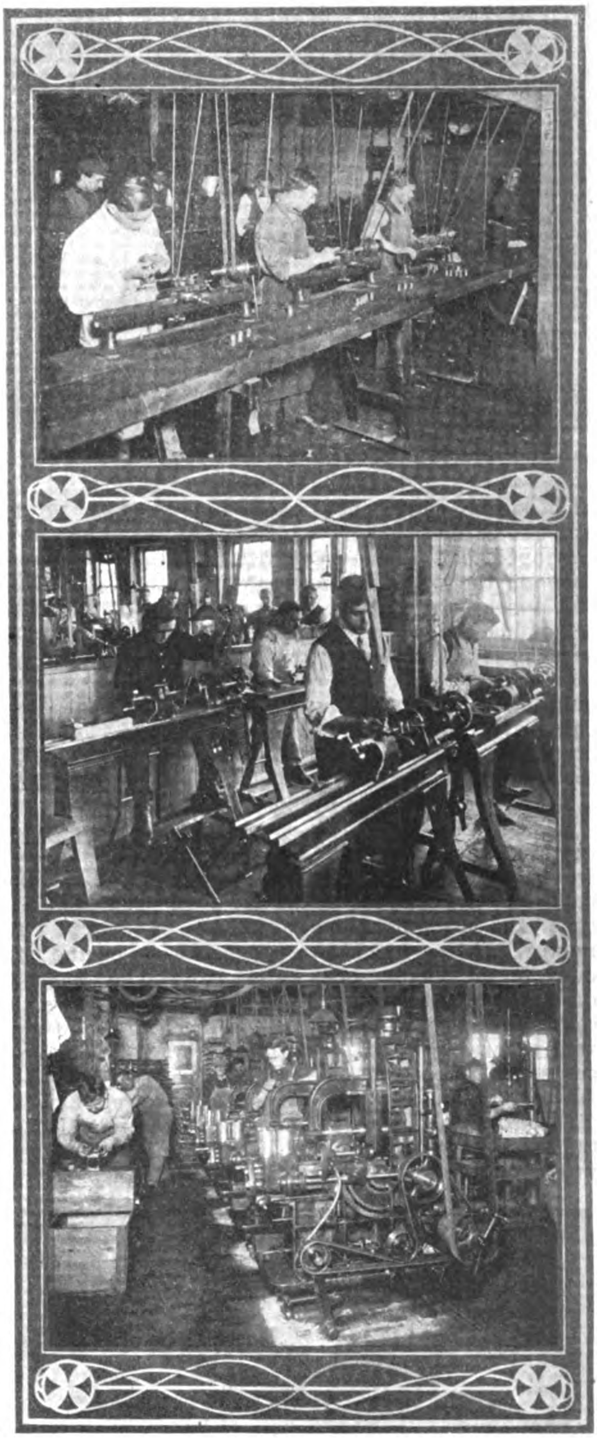
How Magnets Are Energized.

The process of hardening is a special one and is very carefully carried out, having been developed after considerable experiment. The method of energizing the magnets is simple, these being thrust in solenoids, protected by heavy brass cases, through which a direct current of electricity is passing. A solenoid is a coil of wire without a core, and if a bar of iron or steel is placed in one through which a current of sufficient intensity is flowing, it will become a magnet. The magnets are hard, and therefore retain the magnetism; if they were soft, they would soon become demagnetized. This is known as magnetization by induction. After this the magnets are allowed to age, and are magnetized again. Before being sent to the assemblies they are tested, and all that have become weak in a given time are discarded. After the final test, they are painted black to protect them from rusting, and go to the assembling room.

How Base Pieces Are Machined.

The various parts of the base are machined separately on the different faces and are joined together before the pole pieces are bored to receive the armature. The pole pieces, which are cast iron, are smoothed on a special miller with three cutters, so the top, bottom and back have always the same relation to each other when the operation is complete. The holes are then drilled and tapped to receive the screws holding them to the brass base piece and the base is assembled. The method of machining the pole pieces is shown in accompanying illustration.

After the pole pieces are firmly attached to the base, they are placed in a special boring machine with a sliding carriage and three boring bars. While the boring bars are machining one set of three base assemblies the workman is putting three other bases in the special fixture made to receive them. When the cutters have completed the bore in one set, they are backed out, the carriage is shifted, and the other set is machined while the attendant removes the finished parts and replaces them with partially finished members. As all faces of the template are absolutely smooth, as well as the sides of the base assembly, it is possible to bore these very accurately.

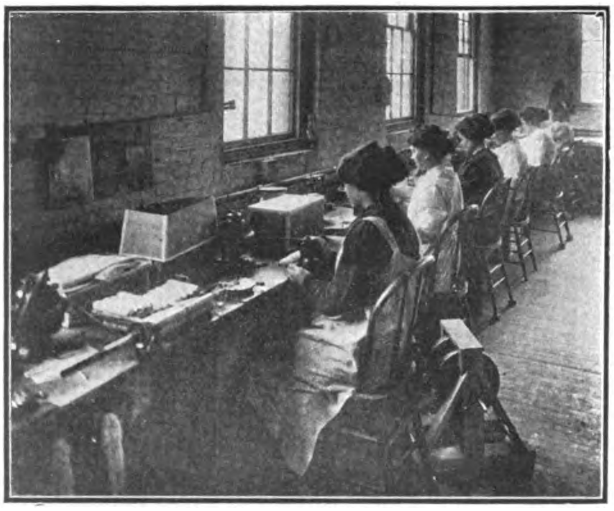


Some of the Operations Requiring Careful Manipulation: At Top, Workmen Winding Armatures; at Centre, Grinding Ball Bearing Races in Delicate Lathes; at Bottom, Gear Cutting Machinery at Work on Distributor Driving Gears.

Some Operations in Armature Construction.

The armature is assembled from wrought iron stampings and iron castings, the shafts are screwed in place, and the whole is turned to fit the bore between the pole pieces, so that a clearance of but 0.01 inch is permissible between the armature and pole members. The shafts are carefully ground after the assembly is trued up, and the outside of the armature is given its final finish by the same process.

When the machining is complete the armature is taken to the winding department, where it is placed in a special chuck in a small lathe, and the proper amount of wire wound on from a large spool under the operator's chair. Every bit of the wire passes through the winder's fingers, who is thus able to detect any break in either the continuity of the conductor or insulation. After winding is finished the armatures are tested for leakage, and if they pass this test satisfactorily the coils are saturated with insulating compound, wound over with a special nonconducting tape and firmly bound in place by a silk binding which fills an annular groove machined in the outer periphery of the armature.



Winding the Primary Coils of Transformers an Exacting Process.

Gear Cutting by Special Machinery.

The gear teeth are cut on special milling machines, the first process being to machine the blanks in lathes true on both sides, hubs and faces. They are then grouped on mandrels, 12 to 20 gears being cut at a time, the machine being automatic in action. The number of gears machined depends upon the size, more of the smaller ones being grouped on the mandrels. The small gears, called armature gears, because they are mounted on the armature shaft, are very accurately bored to fit this member. The larger gears are assembled on their shafts, and the whole assembly trued up. The insulating disc in which the distributing segment is imbedded is assembled on the large gear, and the face is trued up so the metal will be at the same height as the insulating material. All shafts are ground with great accuracy, as it is necessary that they fit the inner bore of the ball bearings closely.

The processes involved in making the bearings consist of forming the races and assembling. The blanks are rough formed on screw machines and are finished ground on special grinders. The faces are trued up on horizontal reciprocating magnetic chuck machines, the inner or bearing surfaces and outer peripheries of the races are ground in small lathes having constricting chucks and extremely high speed grinding wheels of very small diameter. These machines are very delicate, and are called upon to do extremely accurate work.

Finished Parts Are Assembled and Timed.

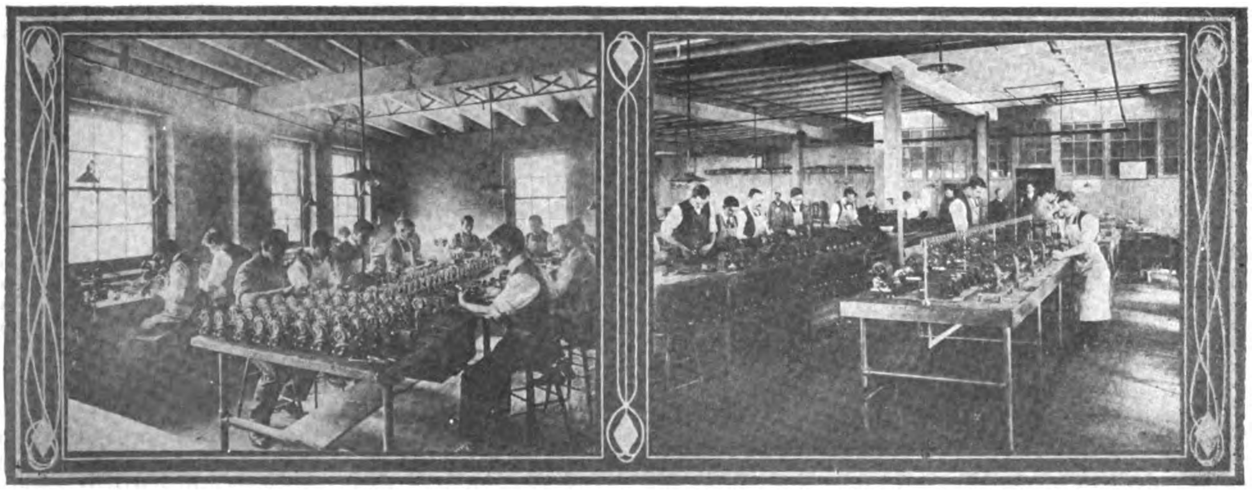
After the various groups are machined and many of them partially assembled, they are sent to the main assembling room where they are put together by expert workmen, thus forming the finished magneto. They are then timed and the contact points adjusted, and are placed on the testing benches and run by belt for some time to see that all parts are functioning properly.

While only a few of the important processes are considered, there are hundreds of other operations through which the parts must go before they reach the assemblers. After every operation, the components are tested with fixed gauges allowing very little variation under or over the size called for, and these testing fixtures and plugs undergo periodical inspection and settings are constantly verified to make sure they have not changed. It is only by constant attention to tools, templates and gauges that the proper standard of machine work necessary in magneto construction is maintained. The reason for absolutely accurate workmanship is not always comprehended by the layman, but its importance can be easily understood when one considers that a clearance of but 1-1000 of an inch more than necessary between the armature and the pole pieces may mean a loss of efficiency of 10 per cent., due to loss of magnetism because of the resistance of the air gap.

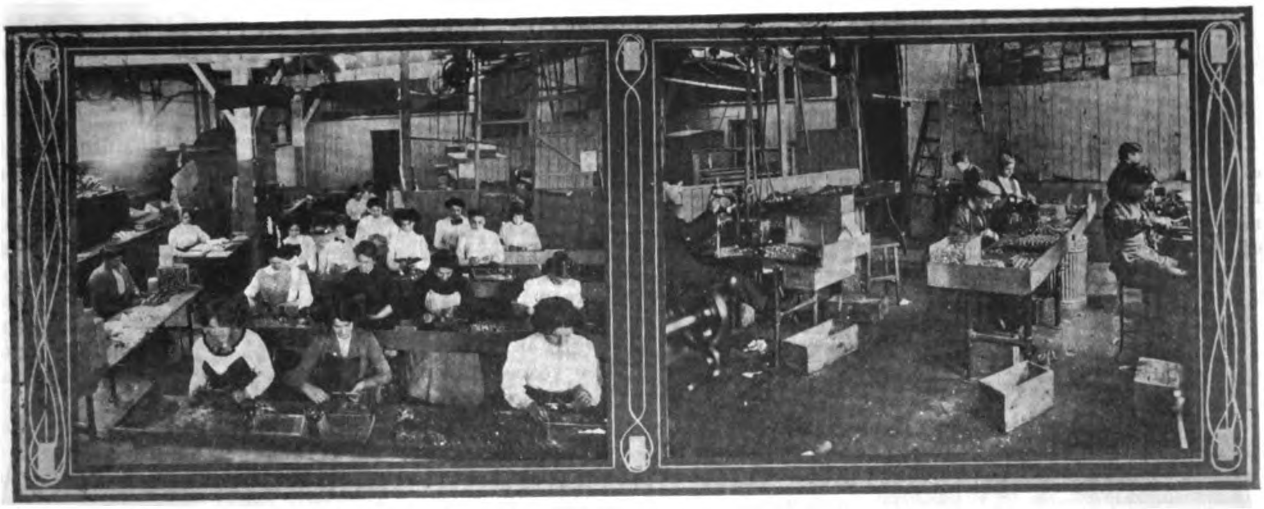
Coil Making Important Work.

As the Splitdorf magneto is a low-tension type, a transformer coil is needed to "step up" the current of small voltage to one of higher value. A separate building is given over to making coils and other small components, so this work does not interfere with the production of magnetos. The first step in construction is to wind the primary coil, which is done on small winding machines. The secondary coils, made of much finer wire are also produced by the same process. After winding, the coils are carefully tested. Passing this inspection they are impregnated with insulating material.

Meanwhile the other parts of the coils are being



When Magneto Parts Are Finished, They Are Assembled by Careful Workmen, as Shown at Left; Finished Product Is Timed, Adjusted and Inspected Before Shipment on Test Bench, Depicted at Right.



At Left, Operatives Are Winding Mica Sheets to Form Insulation of Plug Cores; at Right, Room in Which Components Are Assembled to Form Complete Spark Plugs.

assembled, these including the condenser and switch complete upon its composition plate, and are then sent to the assembling room with the windings. The whole is now placed in a wooden box, the various parts connected to each other and to the terminals by wires, all joints soldered, after which the box is filled with insulating compound to prevent loss of current. The finished coils are tested very carefully for defects.

There is considerable labor involved even in making such simple components as sparking plugs. The shells or bushings of metal are a screw machine product of steel, as are the central electrodes. These parts must be drilled to receive the irridio-platinum wire sparking points, and the central piece must be wound with mica. The operation is done by girls on small winding machines as shown in illustration. To assemble, the core is placed in its shell, then the outside insulation of porcelain is applied and the whole is screwed into the main bushing that screws into the engine cylinder. The plugs are carefully tested and the spark points separated the requisite distance and set to gauge. The finished plugs are then wrapped and boxed ready for shipment.

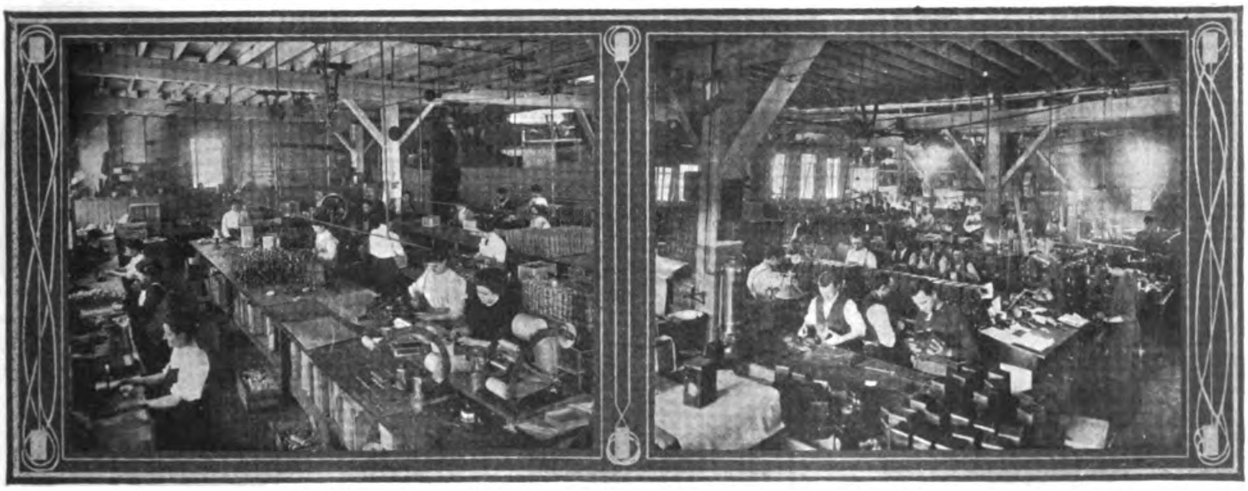
From the foregoing it will be apparent to those interested in automobiles or other self-propelled conveyances that many seemingly incidental or secondary parts are in reality the highly perfected product of as large an engineering and manufacturing organization as many engaged in producing motor cars. Such enterprises as the Splitdorf laboratory have grown to large proportions and produce apparatus upon which depends much of the efficiency of the engines to which they are applied. Not only this, when one considers the severe usage to which these apparently delicate instruments are subjected, it is surprising they endure as well as they do. It is evident there must be a high degree of manufacturing skill displayed that such components may be produced in large quantities.

RATTLE LOCATED IN THE MUFFLER.

A very annoying rattling was located, after considerable speculation, in the muffler. It was noticed that when the engine was stopped and the machine coasted down hill, the rattle ceased immediately. An investigation showed that some of the rivets holding a baffle plate in the muffler had dropped out allowing the plate to rattle.

NEW USE FOR OLD INNER TUBES.

Among the many uses to which old automobile tubes may be turned, after they have outlived their usefulness by reason of rim cuts, blow-outs, etc., is a cure for slipping belts in wet weather. Take a tube of 4.5 or five inches in diameter and slice a piece off crossways with a sharp knife, making rubber rings or bands exactly the width of the engine pulley. Then slip one of the bands onto the pulley. Although the tension of the rubber on the pulley will tend to prevent it from creeping, a little cement or shellac will hold the band firm. The friction of the belt tends to roughen the contact face of the rubber somewhat similar to the corrugations on the business face of a patch, and as the rubber is somewhat spongy and adhesive, the belt grips better and the water is squeezed out by the belt tension quicker than it would be from a leather or metal faced pulley.



Windings of Transformer Coils Are Prepared for Assembly in Room Shown at Left; the Various Components Are Grouped Together, Installed in Boxes, and Tested in Department Illustrated at Right.

WHO'S WHO IN THE INDUSTRY.

W. H. WHITESIDE.

W. H. Whiteside, who has succeeded I. H. Page as executive of the Stevens-Duryea Co., Chicopee Falls, maker of the Stevens-Duryea cars, has had a very wide manufacturing experience, he having been president of the Allis-Chalmers Co. of Minneapolis and Montreal previous to taking up the duties as head of this concern.

W. H. Whiteside, President Stevens-Duryea Company.

Mr. Whiteside has been for 30 years active in industrial production. He became associated with the Du Pont Powder Company, Wilmington, Del., in 1881, and in 1885 he went to the Cleveland, O., Electrical Manufacturing Company, where he remained for 12 years. He went to the Westinghouse Electric & Manufacturing Company as manager of its Washington, D. C., branch in 1898, and among other works he supervised the installation of electric power in the United States navy yards at Portsmouth, N. H., Boston and League Island, each an undertaking of more than ordinary proportions.

He went to the Allis-Chalmers Company in July, 1904, as general sales manager, and after practically a year's service as vice president and as general director of sales he was chosen president of the corporation. Mr. Whiteside is still a director of the Allis-Chalmers Company and is interested in the conduct of its affairs. Mr. Whiteside is widely known to the engineering fraternity, being a member of the American Society of Mechanical Engineers and of the American Society of Electrical Engineers.

WILL SELL EVERITT CARS.

Announcement is made of the appointment of Joseph E. Warren as chief of district managers for the Metzger Motor Car Company, Detroit, maker of Everitt cars. Mr. Warren is one of the best known and most capable trade experts in the industry, and has a wide sales experience in other lines as well. More than 20 years ago he was associated with the National Cash Register Company, in which capacity he won a large number of friends and acquaintances throughout the country. Subsequently, he became connected with the Chalmers organization, when W. C. Hood was sales manager.

Joseph E. Warren, with Metzger Motor Car Company.

As is well known, Mr. Hood is now occupying the position of sales manager with the Metzger company, and Mr. Warren will be one of his chief assistants. The business of the concern has increased so rapidly during the past few months, that it has been found necessary to increase its sales force very materially. Mr. Warren will prove a valuable addition to the Everitt force.

IMPORTANT RUBBER COMPANY CHANGES.

Both motorists and motorcyclists will be interested in learning that Fred I. Willis of Indianapolis, Ind., and G. H. Hamilton of New York, recently secured a large block of stock in the Kokomo Rubber Company, Kokomo, Ind. A reorganization meeting of the stock-

Officials of the Reorganized Kokomo Rubber Company: From Left to Right, D. C. Spraker, President and Treasurer; F. I. Willis, Vice President; G. H. Hamilton, Sales Manager.

holders was held early in the month, at which this announcement was made public. Mr. Willis becomes a vice president of the concern, and Mr. Hamilton sales manager.

Both men are well known in the industry. The former was president of the Federation of American Motorcyclists in 1909 and 1910, being succeeded at the Buffalo convention in July by Mr. Hamilton. He has held the position of secretary in the National Association of Cycle Jobbers since its organization, seven years ago, and it readily will be seen that his acquaintance is large. In addition, he was until recently secretary-treasurer of the Hearsey-Willis Company of Indianapolis. Mr. Hamilton formerly was eastern sales manager of a large rubber concern.

The Kokomo Rubber Company was organized several years ago by local men, and has been engaged in the manufacture of Kokomo bicycle, vehicle, automobile and motorcycle tires. The plant now covers eight acres and the concern employs 300 men. The newly elected officers are: President and treasurer, D. C. Spraker; vice presidents, Milton Kraus and Fred I. Willis; secretary, George W. Landon; superintendent, John Neary; sales manager, G. H. Hamilton.

Harry C. Stutz, Chief Engineer Ideal Motor Car Company.

Leslie B. Sanders, New Sales Manager Lion Motor Car Company.

Claude S. Briggs, President New Detroit Organization.

HARRY C. STUTZ.

The Stutz cars are the design of Harry C. Stutz, chief engineer and factory manager for the Ideal Motor Car Company, Indianapolis, Ind., who is one of the best known men in the automobile industry. Mr. Stutz is one of the pioneers, as he has built machines for more than 15 years. He was one of the organizers of the American Motor Car Company, and designed the first American car. He later joined the Marion Motor Car Company and for four years was chief engineer. The Marion cars built in 1908-9-10 were his design exclusively and were built under his supervision. The Stutz cars are the latest and best creation of a carefully developed and long experience, together with splendid material and high class workmanship and manufacturing facilities. Mr. Stutz is president and general manager of the Stutz Auto Parts Company, maker of the Stutz transmission and rear axle, which construction is used in the Stutz cars and has been adopted by a number of manufacturers.

LESLIE B. SANDERS.

Leslie B. Sanders, sales manager of the Lion Motor Car Company, Adrian, Mich., is the head of an organization which has been perfected for the purpose of making a very strong selling campaign throughout the country. Mr. Sanders was for a considerable period prior to joining the Lion company, sales manager of District B for the United States Motor Company, and before that was connected with several well known concerns.

Mr. Sanders has directed his energies toward broadening the market for the Lion machines, which he enthusiastically declares are the best produced for the price, and his selling force is carefully chosen with strong agencies in many of the commercial centres of the country. The productiveness of the company will be unable to keep pace with the demands if Mr. Sanders' campaign is as successful as he is sanguine it will be.

CLAUDE S. BRIGGS.

A concern that has not as yet been given a corporate name has been organized at Detroit, Mich., to manufacture a pleasure car that will be known to the industry as the Detroiter, and the head of this concern is Claude S. Briggs, who was the organizer, president and general manager of the K-R-I-T Motor Car Company, and who later and until recently was general sales manager of the Brush Runabout Company. Mr. Briggs has been actively identified with the motor vehicle industry for several years and became widely and favorably known. The new company has capital of $200,000 and it has practically completed plans for manufacturing 1000 machines during the year to come.

The Detroiter car will, as now planned, be of two models, the one a two-passenger roadster and the other a five-passenger touring car. These cars will have a power plant with long stroke motor that will develop 25 horsepower, and among the mechanical features will be the rear axle and brake constructions, which make for unusual strength and durability.

SAVING TIRE EXPENSE.

The United States Tire Company, New York City, is mailing a neat brochure which resembles a pocketbook filled with gold certificates. Each of these is printed in colors and bears an illustration of some vehicle fitted with one of the several makes of tires manufactured by the company. Many excellent reasons are set forth why a saving can be effected by utilizing its product.

PEERLESS BOSTON BRANCH A MODEL STATION.

MODERN methods of caring for the car owner include the location of thoroughly equipped service buildings in all large centres. In some respects, many of these are fitted better to look after the needs of customers than some automobile factories. It is one of the features of the industry to which much attention has been paid recently, and one in which the future will see many innovations and amplifications. In general appointments and careful attention to detail, the building of the Peerless Motor Car Company of New England at 660 Beacon street, Boston, is a model plant. Not only is the location well chosen, but the arrangement of the various departments is such as to facilitate rapid and satisfactory work. The entire establishment undoubtedly is one of the finest and most complete motor car sales and service stations in the country.

The structure has a 90-foot front on Beacon street, near the junction of Commonwealth avenue, and besides being in close proximity to Boston's fashionable residential district, is on the through lines of travel. The depth is 115 feet, and light is available on all four sides. The six stories and basement afford over 70,000 square feet of floor space.

The concern is a direct factory branch of the Peerless Motor Car Company, Cleveland, O., and looks after the distribution of Peerless cars throughout the entire New England district. The salesroom is on the first floor and measures 90 by 45 feet. Quiet refinement characterizes the fittings, the floor being finished in terazzo and mosaic, while the wainscoting is of mahogany. The furniture is of the latter material, the special design being such as to harmonize with the general scheme of decorations. Here the product of the company is best displayed for the inspection of the prospective purchaser. The present owner also is received courteously and prompt attention is paid to his wants or troubles as the case may be.

In the rear of this floor is the garage for demonstrating cars and the actual service department, devoted to the immediate wants of the motorist or chauffeur. The space is 70 by 90 feet. A pleasantly situated room on the second floor, plentifully supplied with daily papers, up-to-date automobile and other magazines, is reserved for the use of chauffeurs while waiting.

The general offices are located on this floor, these being completely furnished, systematically arranged and free from confusion. Here, most of the business of the territory covered by the branch can be attended to promptly, thereby relieving the factory of much congestion.

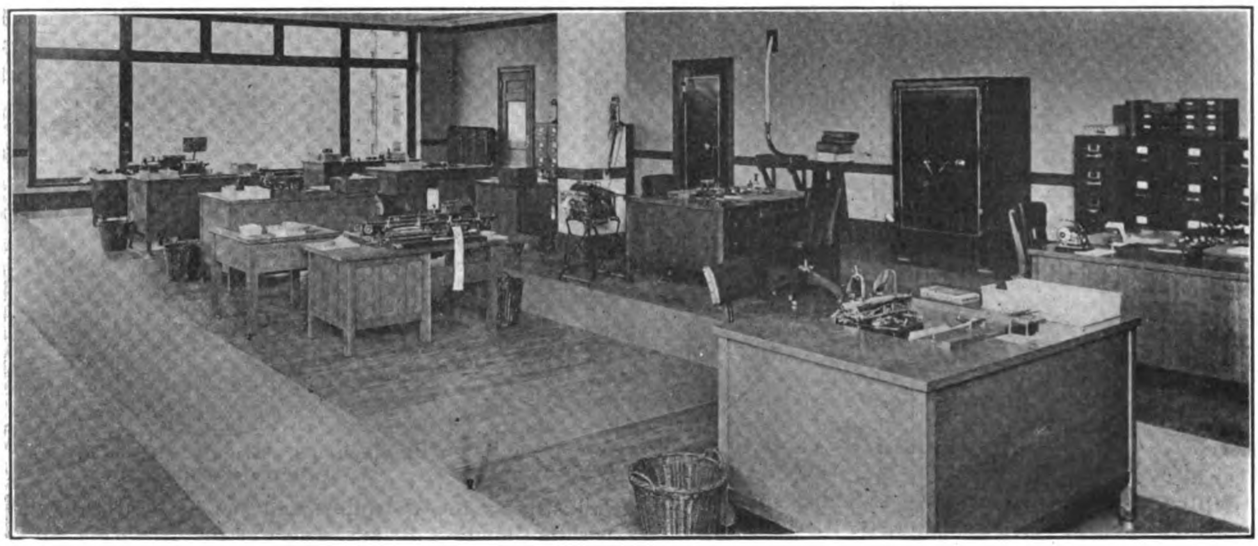
Assuming that a car comes into the building for a complete overhaul: The owner is conveyed to the stock room by a small automatic elevator, which connects the salesroom with each of the six floors. The former is directly behind the general offices, and a large high counter separates it from the public lobby, off which opens the chauffeur's room, the superintendent's private office, and the accessory department. In the latter is displayed extra motor car equipment, including trunks, windshields, speedometers, robes, etc., from which the owner may make selection for the further improvement of his machine.

All business with the owner or chauffeur is conducted over the counter. The statement of repairs desired is made upon a repair card system, after which the car is taken from the garage to the basement by one of the two large electric freight elevators connecting all departments. Here it is stripped of its sundry equipment, which is placed in a locker. Besides these lockers, the basement provides storage for extra bodies and cars awaiting delivery, and contains a boiler room, a smoking room for the use of employees during the noon hour, and a receiving department. In one corner of the boiler room is the Curtis automatic compressed air system, by which a pressure of 80 to 100 pounds is maintained, and the Lamson pneumatic cash service system employed between the office and receiving department.

The car is then conveyed to the overhauling room on the fourth floor. Here every removable part of the mechanism is disassembled, cleaned, readjusted and replaced if necessary, and all features properly reassembled and put in first class condition for a strenuous season's work.

In the rear is the machine shop, completely equipped with machine tools, operated for the most part by individual electric motors for the sake of economy. This section contains: One 18-inch and two 16-inch lathes, one 16-inch shaper, 14-inch drill press, small upright drill press, small speed lathe, two-wheel grinder, large and small arbor presses, many special tools, pneumatic drills and riveting machines, and others necessary for prompt and efficient work.

There is a place for everything and everything must be in its place. The racks are so conveniently located that it is easier to put the tools where they belong than elsewhere. Every workman is required to have a full kit of tools, and should one become lost



Systematically Arranged Business Department of the Peerless Motor Car Company of New England's Service Station at Boston.

or broken, it must be replaced immediately at a reasonable cost from stock. The habit of borrowing is firmly discouraged. Special tools are kept in the machine tool department, and a regular factory checking system is employed to keep track of them. Each workman has a certain number of brass checks, which he may exchange for the tools required.

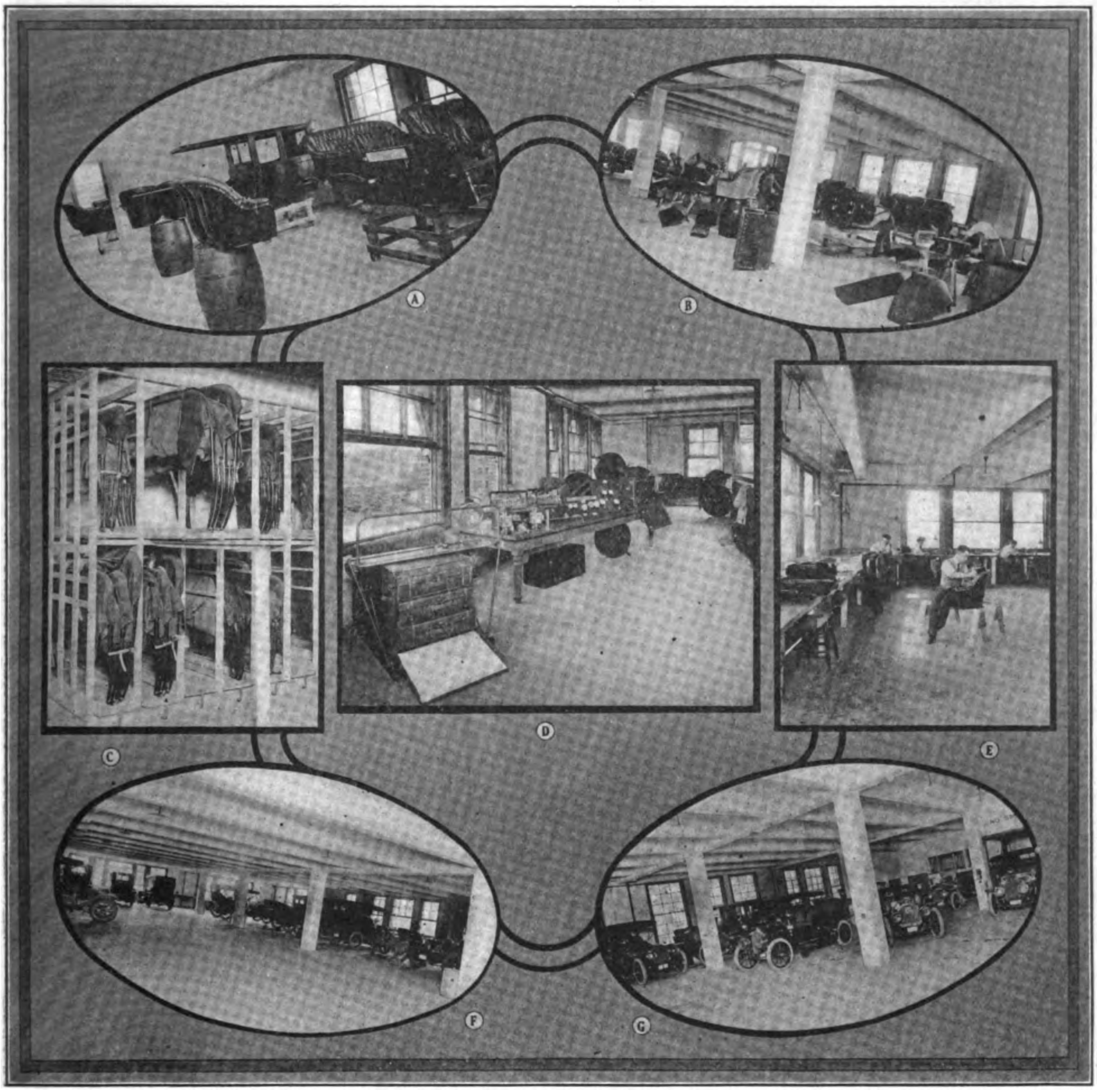
All electric wires throughout the machine shop are enclosed in metal conduits, and switches are of special design, conveniently arranged. Work benches throughout the building are supported on cast iron brackets on which rest three-inch maple planks provided with deep, wide drawers and trays. Each workman has a vise and compressed air is piped to his bench. Another feature is the emergency medicine case, with bandages and antiseptic dressings for use in case of accident.

Three substantial cast iron motor testing stands occupy one corner of the overhauling room. By way of special equipment may be mentioned the portable crane with windlass attachment, by means of which one man can remove a motor from its chassis with ease. It also is found useful in handling gearsets, rear axles, bodies, etc. No ropes are employed in this work, but specially designed iron slings, not only facilitate operations, but prevent damage to less substantial moving parts.

Chassis are supported on cast iron standards while undergoing overhaul. The motors are tested under their own power, and excellent provision is made for water, gasoline and ignition connections, as well as conducting the exhaust gases into the open air over the roof of the building.

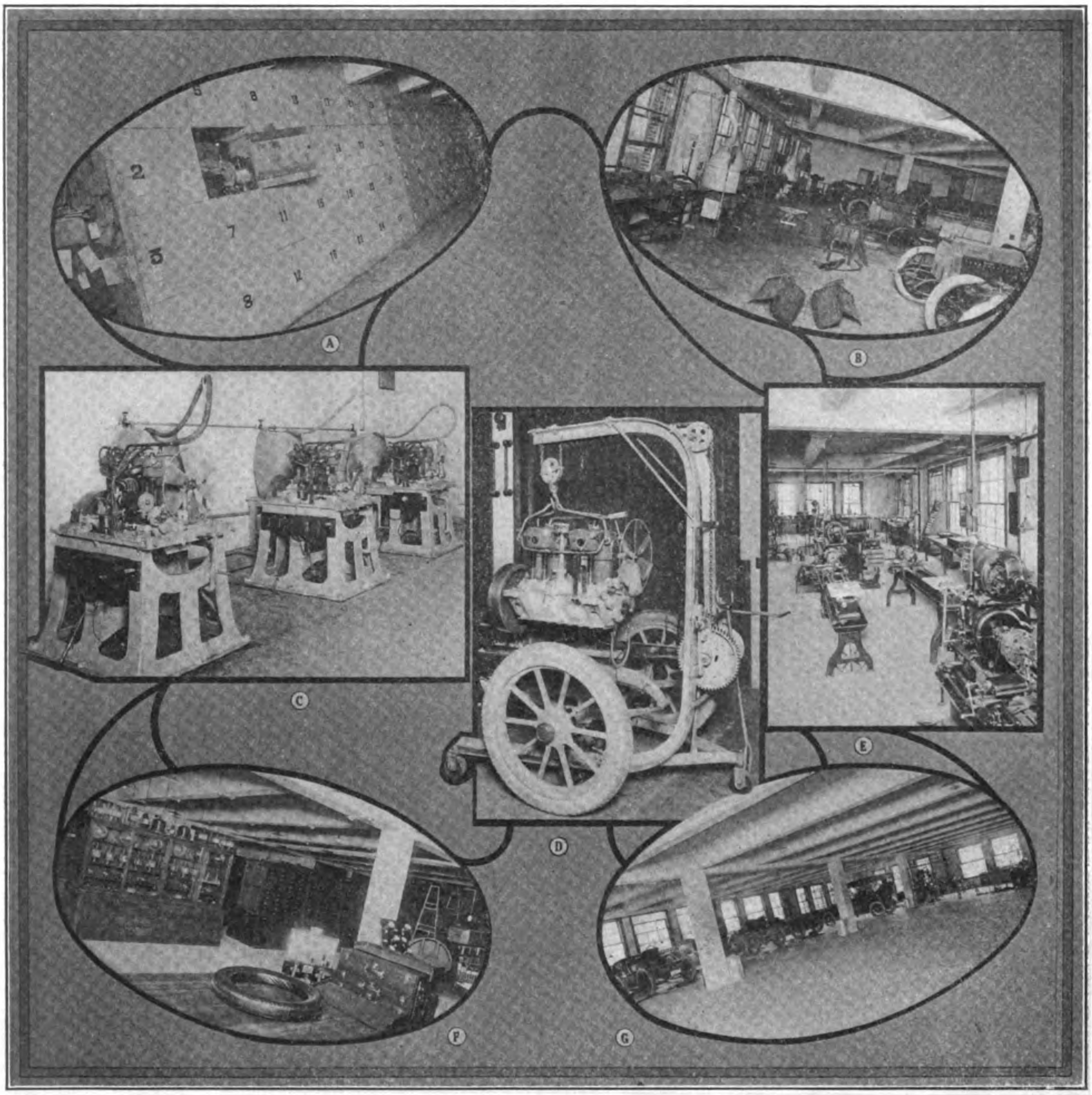
The third floor is devoted to the small repair department, which it has been found convenient to have located separately from the general overhauling work, in order to avoid confusion. This is devoted solely to jobs requiring but a few hours' or days' time. The equipment consists of an emery wheel grinder, speed lathe, drill press and valve grinding machine.

The stock room, a consideration of which naturally comes in connection with repair work, occupies a neatly furnished apartment on the second floor. Practically all of the spare parts are kept in the drawers of a long series of cabinets, these being of various sizes to form suitable receptacles. Most of them are



Important Features of Peerless Plant: A, Bodies Drying in Varnish Room; B, Plenty of Light in Painting Department; C, Specially Devised Rack for Storing Tops; D, Interior of Accessory Salesroom; E, Workmen Engaged in Upholstery and Trimming Shop; F, Where the Small Repair Jobs Are Cared for on the Third Floor; G, Garage or Actual Service Department, Devoted to Immediate Needs of Owner or Chauffeur.

numbered so as to correspond with the list of the parts they contain. The cabinets are arranged according to the model of the car for which the parts are made, the system being such that even a novice can find them readily. A large table is provided, on which incoming goods are placed and checked before being distributed to their respective bins. A very simple and substantial cast iron rack holds the supply of tires, battery and tool boxes, etc., and specially constructed tills and cabinets contain the raw bar and sheet metal materials, tops and seat cloth and fabrics, batteries, and oils and greases in cans.



Distinctive Arrangement of Peerless Departments: A, Lockers Provided for Accessories in the Basement; B, Where the Metal Work for Special Bodies Is Performed in the Blacksmith Shop; C, Substantial Motor Testing Stands; D, Portable Crane Removing Engine from Chassis; E, Complete Equipment of Machine Tools Operated by Individual Electric Motors; F, System as Applied to Stock Parts; G, Orderly Appearance of General Overhauling Room.

The blacksmith and tinsmith shops are on the fifth floor, occupying a portion of the body trimming department. The three forges are operated by individual electric motors. Like all other parts of the organization, these two shops are in charge of workmen skilled in their trades, who are provided with every facility for producing good results. Here, the metal work for special bodies, such as fenders, is formed and fitted.

Two-thirds of this floor is devoted to trimming and upholstering. A special rack is provided for the storage of motor car tops, during the time the bodies are being overhauled, painted, etc. This has two decks, and is extremely simple in operation. The workman who wishes to take a top out of the rack, pulls a handle on the baseboard, whereupon it slides along smooth rails or guides, so that the services of but one man are needed to remove and adjust the fitting to the vehicle in question. A series of steps is designed to be placed alongside the car, so that it is easy to reach any part of the top when raised.

Besides the minor repair work conducted on the third floor, is that of electroplating, a special room being provided for that purpose. This is arranged for replating brass, nickel and copper and for buffing and polishing plated articles. The equipment includes: Four electroplating baths, one each for brass, nickel, copper and black nickel; potash dip, acid dip, rinsing trough, solution cleansing jars, two electrically driven buffing wheels and a work bench.

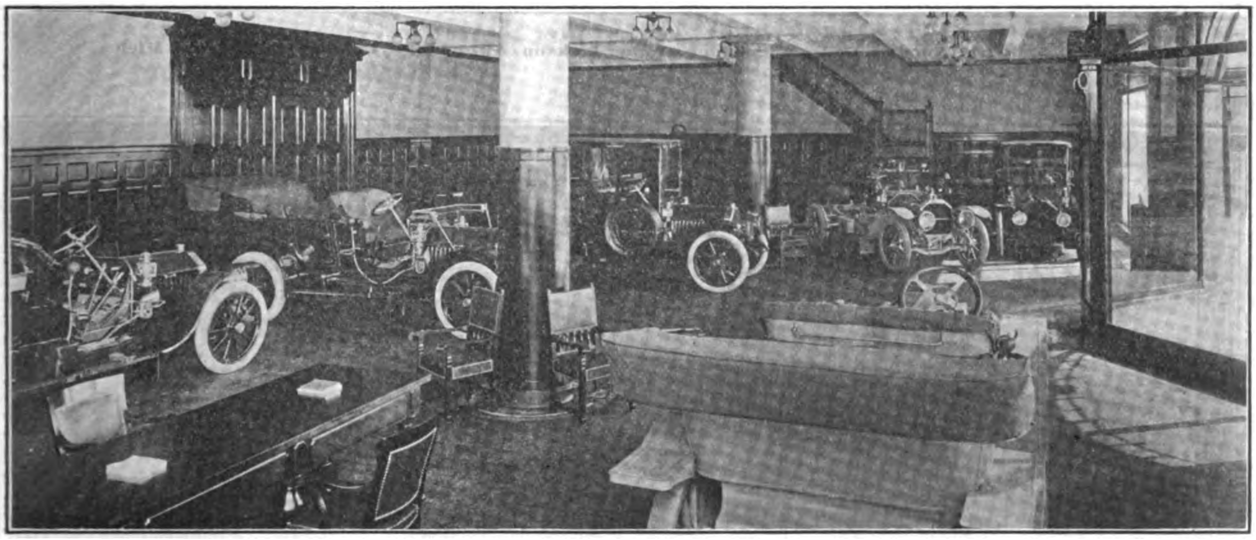
A particularly interesting feature of the building is the painting and varnishing department on the top floor. The lighting facilities are most important, and the Peerless paint shop is well equipped in this respect. The dust proof drying room is at the rear. A specially constructed rack occupies one portion, this being reserved for the storage of glass fronts, mud aprons, and similar parts, after they have been cleaned, painted and varnished, and while they are awaiting reassembly on their respective cars. Steel clothes lockers, sanitary wash basins, lavatories, etc., are provided for the workmen, whose interests are looked after in every way, conducive to convenience, construction and arrangement.

Pleasantly Situated Chauffeurs' Waiting Room in Peerless Building.

The entire building is of steel and cement, the posts being located 30 feet apart, so as to permit of the easy manipulation of cars. Even the floor is marked with heavy white lines, which indicate the places in which the vehicles must be left, so that a sort of military precision is everywhere apparent. Besides those previously mentioned, there is a small electric freight elevator, connecting all floors, and passing through the stock room, this being utilized for transferring heavy parts where needed. In addition, concrete floors provide an easy and rapid means of egress in case of necessity.

There are some 150 employees on the payroll, exclusive of the office force, indicating the extent of the business carried on by this branch. System and simplicity prevail throughout every department, and nothing is allowed to interfere in the slightest with the established policy of doing even small things well. This is best exemplified in the conduct of the garage, where a record of each car that comes in and goes out of the place is maintained rigidly. Bowser oil and gasoline storage and supply outfits handle the fuel and lubricant for the cars employing this service, and a very simple card system is used in connection with a Fisher tag writing machine for such repairs and adjustments as are needed.

Accompanying illustrations bring out the various details in a satisfactory manner. Particularly, do they present the well arranged interior of the building and the importance of the lighting facilities. It only remains to point out the peculiar advantage of having such work performed by men who are skilled in handling Peerless cars, thus being thoroughly familiar with the needs of their owners.



Quiet Refinement Characterises the Salesroom of the Peerless Branch, Covering the Entire New England Territory.

PARCEL CARRIER OF ENGLISH DESIGN.

A device for carrying articles on front of a motorcycle or bicycle has been brought out by an English concern. It consists of a piece of strong wire, rubber covered to protect the nickel of the handle bars, bent in the shape of a ram's horn and attached so as to guard the post and extending over the handle bars on each side. After turning below the bar, the ends are bent upward in a U shape for carrying a parcel.

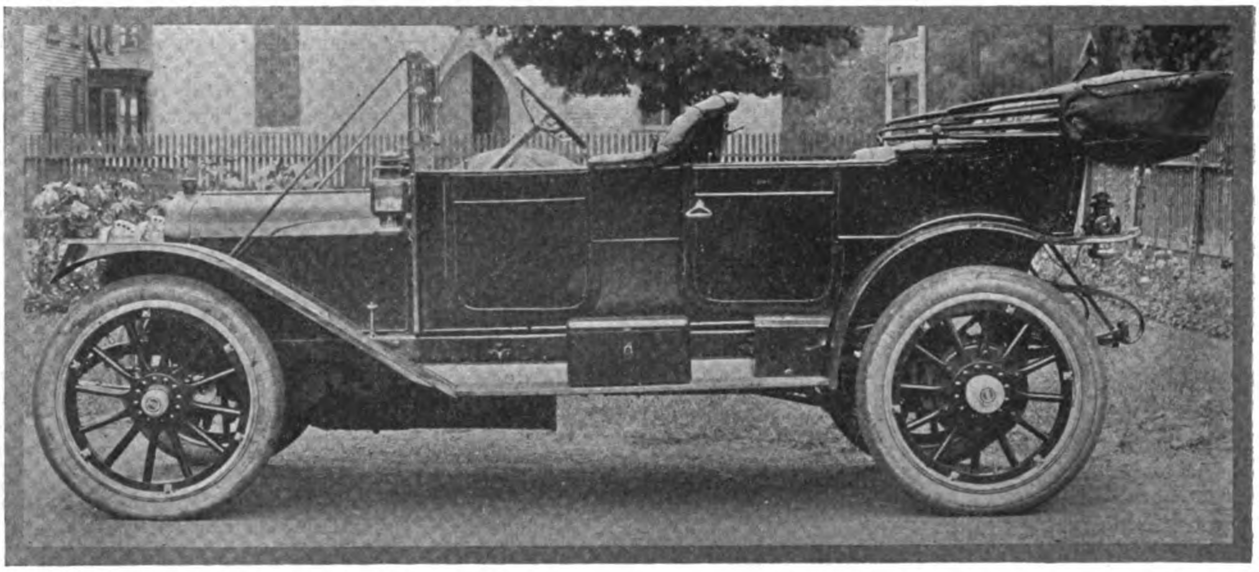
REMOVING OBSTRUCTION IN FEED PIPE.

The stopping of the engine after every few yards of running sometimes indicates a choking in the gasoline feed pipe from the tank to the carburetor. This may be relieved at times by disconnecting the feed pipe and giving it a few blasts of air from a tire pump. If this fails, a piece of fine strong copper wire may be cautiously probed in the piping to remove the obstruction without injuring the tubing.

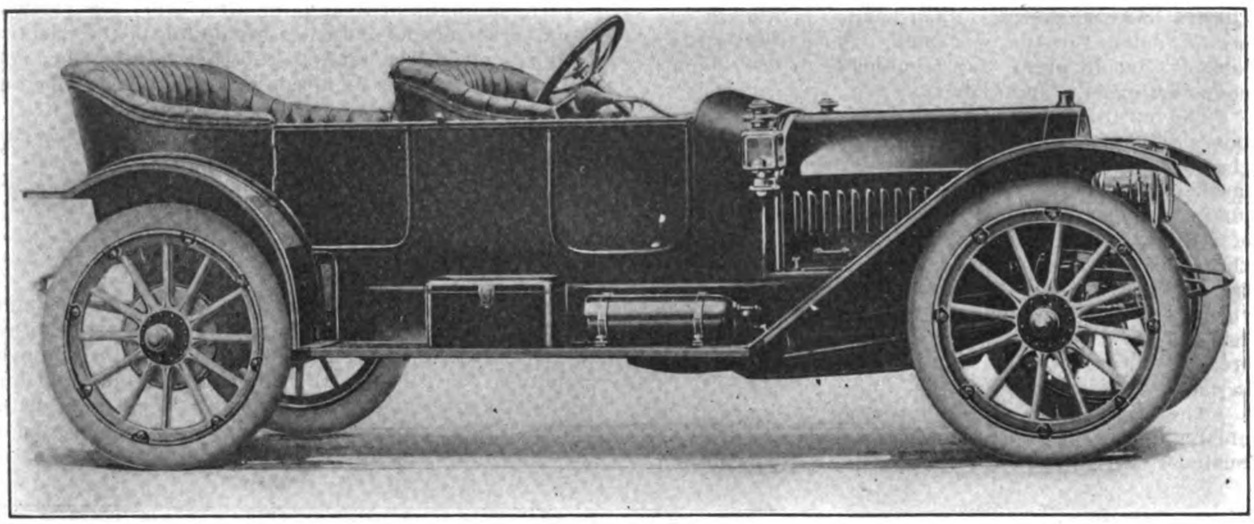
MAKING ENGINE START EASIER.

The best way to start a motorcycle power plant, avoiding unnecessary racing and clattering, whether it has a free engine clutch or not, is to turn it over rapidly a few times with the throttle wide open and the ignition cut off. This will give fresh charges of gas in the cylinders. Then, close the throttle to normal position, switch on the spark and give the engine a short, sharp kick either with the pedals or hand crank, if such is provided. This method will be found easier than pedaling or cranking until one is winded, and will also prevent the engine racing.

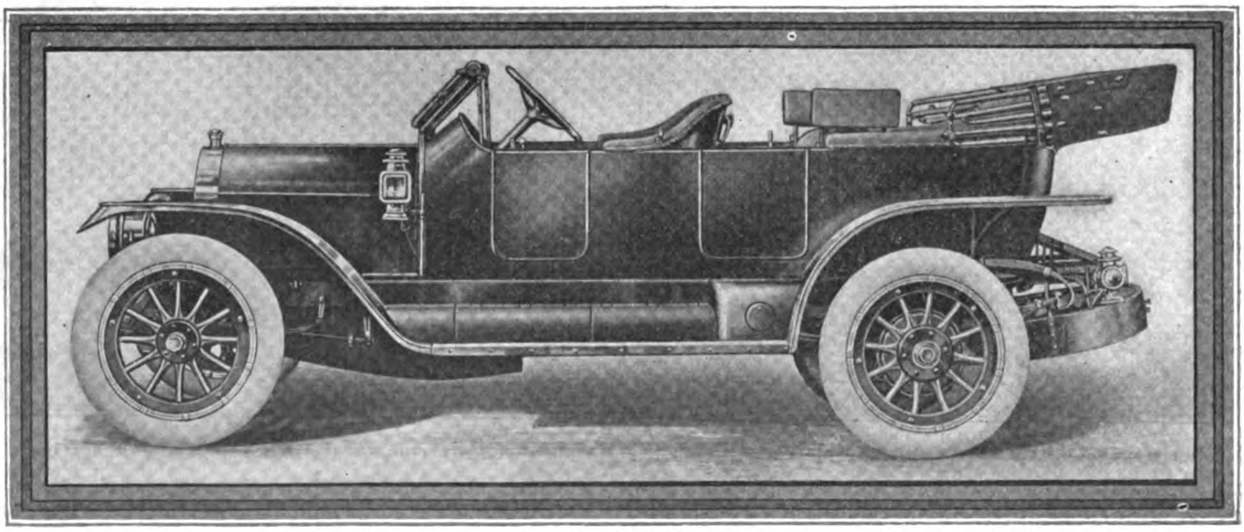
LEADING TYPES OF 1912 CARS.



Model 40, with Touring Body, a Product of the Corbin Motor Vehicle Corporation, New Britain, Conn.



Model 52, with Touring Body, a Product of the Jackson Automobile Company, Jackson, Mich.



Model R-45, with Six-Passenger Body, a Product of the Knox Automobile Company, Springfield, Mass.

TABLE OF SPECIFICATIONS OF THE TWO CORBIN MODELS FOR 1912.

MODEL 30.

Motor—4.5-inch bore, 4.25-inch stroke.
Cooling—Gear pump, honeycomb radiator.
Carburetor—Float and jet.
Gasoline capacity—15 gallons.
Ignition—Double system including magneto.
Lubrication—Eccentric pump supplying splash. Reservoir holds six quarts.
Clutch—Leather faced cone.
Gearset—Selective sliding gear—three forward, one reverse.
Wheelbase—115 inches.
Tread—56 inches.
Wheels—34 by 4 inches fitted with Universal quick detachable rims.
Brakes—Two separate independent sets on rear wheels.
Springs—Special alloy steel. Front, semi-elliptic; rear, three-fourths elliptic.
Axles—Front, I beam section; rear, semi-floating.
Weight with standard equipment—Roadster, 2300 pounds; Touring car, 2500 pounds.

MODEL 40.

Motor—4.75-inch bore, 5.5-inch stroke.
Cooling—Gear pump, honeycomb radiator.
Carburetor—Float and jet.
Gasoline capacity—20 gallons.
Ignition—Double system including magneto.
Lubrication—Over and over self-contained circulating system. Reservoir holds two gallons.
Clutch—Leather faced cone.
Gearset—Selective sliding gear—three forward, one reverse.
Wheelbase—120 inches.
Tread—56 inches.
Wheels—36 by 4 inches fitted with Firestone quick detachable demountable rims.
Brakes—Two separate independent sets on rear wheels.
Springs—Special alloy steel. Front, semi-elliptic; rear, three-fourths elliptic.
Axles—Front, I beam section; rear, full floating.
Weight with standard equipment—Toy tonneau, 3000 pounds; Torpedo, 3000 pounds; Touring car, 3200 pounds; Limousine, 3850 pounds.

DETAILED SPECIFICATIONS OF THE THREE NEW MODELS OF JACKSON CARS FOR 1912.

MODEL 52.

Motor—4.75-inch bore, 4.75-inch stroke, individual cylinders.
Cooling—By water, thermo-syphon system.
Carburetion — Automatic, auxiliary air valve.
Ignition—Double system, low-tension magneto and batteries.
Lubrication—Special Jackson splash and pump.
Clutch—Multiple disc in oil.
Gearset—Selective, sliding gear, three speeds forward.
Wheelbase—124 inches.
Tread—56 inches (60 on special order).
Tires—36 by 4 inches on demountable rims.
Springs—Full elliptic, all around.
Axles—I section front, ball and roller bearing rear.
Frame—Pressed steel, dropped between axles.
Weight—2700 pounds.

MODEL 42.

Motor—4.5-inch bore, 4.5-inch stroke in pairs.
Cooling—By water, thermo-syphon system.
Carburetion — Automatic, auxiliary air valve.
Ignition—Double, low-tension magneto and batteries.
Lubrication—Special Jackson splash and pump.
Clutch—Multiple disc in oil.
Gearset — Selective, sliding gear, three speeds forward.
Wheelbase—118 inches.
Tread—56 inches (60 on special order).
Tires—34 by 4 inches on all four wheels.
Springs—Full elliptic all around.
Axles—I section front, ball and roller bearing rear.
Frame—Pressed steel, dropped between axles.
Weight—2400 pounds.

MODEL 32.

Motor—Four-inch bore, four-inch stroke, in pairs.
Cooling—By water, thermo-syphon system.
Carburetion—Automatic, spray type, auxiliary air valve.
Ignition—Double, low-tension magneto and batteries.
Lubrication—Special self-contained, Jackson splash.
Clutch—Multiple disc in oil.
Gearset — Selective, sliding gear, three speeds forward.
Wheelbase—110 inches.
Tread—56 inches (60 on special order).
Tires—32 by 3.5 inches on all four wheels.
Springs—Full elliptic, all around.
Axles—I section front, ball and roller bearing rear.
Frame—Pressed steel, dropped between axles.
Weight—2200 pounds.

TABLE OF SPECIFICATIONS FOR THREE 1912 MODELS OF KNOX CARS.

MODEL R, FOUR-CYLINDER.

Motor—Five-inch bore, 4.75-inch stroke.
Cooling—Centrifugal pump, honeycomb radiator.
Carburetion—Stromberg automatic, auxiliary air valve.
Gasoline capacity—16 gallons.
Ignition—Double system, Bosch magneto, battery.
Lubrication—De Dion system, oil pump outside crankcase.
Clutch—Three-plate, dry, cork inserts.
Gearset—Selective, sliding gear, three speeds.
Wheelbase—117 inches.
Tread—56 inches.
Tires—36 by 4.5 inches on Fisk demountable rims.
Brakes—Two sets within rear hubs, equalized.
Springs—Semi-elliptic front, three-quarter rear scroll ended, 50 inches long.
Axles—I section front, semi-floating rear.
Frame—Cold pressed alloy steel.
Weights—Two-passenger, 3000 pounds; 4 raceabout, 3100; 5 tonneauette, 3250; 4 and 5 torpedo, 3450; 7 touring, 3500, and 7 limousine, 3700.

MODEL R-45, FOUR-CYLINDER.

Motor—Five-inch bore, 5.5-inch stroke.
Cooling—Centrifugal pump, honeycomb radiator.
Carburetion—Stromberg automatic, auxiliary air valve.
Gasoline capacity—18 gallons.
Ignition—Double system, Bosch magneto, battery.
Lubrication—De Dion system, oil pump outside crankcase.
Clutch—Three-plate, dry, cork inserts.
Gearset—Selective, sliding gear, three speeds.
Wheelbase—126 inches.
Tread—56 inches.
Tires—36 by 4.5 or 37 by 5 inches, Fisk demountable rims.
Brakes—Two sets within rear hubs, equalized.
Springs—Semi-elliptic front, three-quarter scroll ended rears, 54 inches long.
Axles—I section front, full floating rear.
Frame—Cold pressed alloy steel.
Weights—Four-passenger raceabout, 3350; 5 tonneauette, 3500; 6 torpedo, 3700; 7 touring, 3750; 7 limousine, 3950

MODEL S, SIX-CYLINDER.

Motor—Five-inch bore, 4.75-inch stroke.
Cooling—Centrifugal pump, honeycomb radiator.
Carburetion—Stromberg automatic, auxiliary air valve.
Gasoline capacity—16 gallons.
Ignition—Double system, Bosch magneto, battery and Connecticut distributor.
Lubrication—De Dion system, oil pump outside crankcase.
Clutch—Three-plate, dry, cork inserts.
Gearset—Selective, sliding gear, three speeds.
Wheelbase—134 inches.
Tread—56 inches.
Tires—38 by 5.5 inches on Fisk demountable rims.
Brakes—Two sets within rear hubs, equalized.
Springs—Semi-elliptic fronts, three-quarter scroll ended rears, 54 inches long.
Axles—I section front, full floating rear.
Frame—Cold pressed alloy steel.
Weights—Four-passenger raceabout, 3700 pounds; 5 tonneauette, 3900; 6 torpedo, 3950; 7 touring, 4000; 7 limousine, 4200.

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BUSINESS PROSPECTS EXTREMELY PROMISING.

The nation is so large, the commercial interests are so varied and the business conditions so diversified that it is not possible nor practical to determine an average and apply this to every situation it is desired to analyze. While it is not probable that the fullest extent of activity will be realized until the different factors that make for unrest have been disposed of, or at least minimized, it is safe to assume that there is little to fear so far as prospects are concerned. In fact there ought to be a steady and consistent betterment of trade volume, and with this will come a certain degree of confidence that will be generally promotive.

Locality summaries are not always dependable, for the aggregate of business may be, and no doubt is, a very small part of the entire transactions of the nation. It would be manifestly impossible to gain even a fair average by dealing with generalities. For this reason any statement from any given section cannot be accepted as a basis on which to gauge business as a whole, and local conditions may only be represented by the expression of one or a few rather than of the entire number.

There is no question, however, that the automobile industry can look forward confidently to a season of improvement. There are numerous reasons for this. The anticipatory buying of agents may be first of all regarded as conservative, and the forecasts are generally well within the limits of possibilities. While this may be applied to pleasure cars as a whole it is a fact there is an entirely different aspect so far as the industrial wagons are concerned.

The pleasure vehicle is to be regarded more as the convenience or the luxury, but with the commercial transport business considerations largely, if not wholly, control buying. The volume of business transacted by the builders and the distributors of power wagons during the past season exceeds very largely any past experience. The utility of this type of vehicle has been so capably demonstrated during the year now closing that the agents and the manufacturers find themselves generally with orders ahead that will require considerable time to fill.

The demand for wagons and trucks is surprisingly large at this season of the year, based on experience and expectations, and there is no reason to believe that when the spring deliveries are begun there will be a recurrence of conditions such as were developed for several years with pleasure cars. In other words, the orders will be decidedly larger than the available stock and delays will be unavoidable. Just to what extent this will be realized and what results will follow are problematical subjects, but it is unquestioned that if this situation is anticipated and understood it can be better coped with.

The autumn has always been the period of the least activity of the year, and while this has been the experience during the last two months there has been an improvement as compared with previous seasons. The belief prevailed a year since that cars would be very cheap and that used machines could be bought at a very large discount from cost, and the prevalence of this opinion was the occasion of a general stagnation of business. This supposition had its effect in several ways, first of all deterring many from buying until the cars then owned had been disposed of, selling being conditional upon the realization of a certain price, causing many to "shop" cars with sale dependent upon offers close to the prices established; lessening the prices of used cars in the hands of the dealers, and generally causing a condition of stagnation that could not be stimulated until well into the spring.

All this has been changed. There is a better understanding of conditions and a knowledge that automobiles have a commercial value when contrasted with other industrial products because of a constant and increasing demand. The markets of the nation are upon a more substantial basis. There is a feeling of greater business security and confidence. The ramifications of the motor vehicle industries are such that hardly another industry can be named that has not some relation and reflects to a greater or less measure the activities. In this light and considered soberly it will be seen that the automobile industry does not differ with any other. It is not alone as regards influence of business conditions. In fact, it is not more affected than is any other by business development or depression.

From practically every section of the country there is report that seems to justify the belief that the autumn and winter business will be larger, and the transactions will be materially increased when the number of industrial vehicles required is included. There is one factor that cannot be lost sight of, and that is that eventually the major part of the manufacturing and the distributing will be of wagons and trucks, and the minor part will be the making and selling of pleasure machines. The ratio of the one will increase and the other will correspondingly decrease until a level is found. This may be realized later or earlier than may now be estimated, but the exact time of realization is not material.

In the communities where machines are produced, noticeably in cities like Detroit, Cleveland, Indianapolis, Buffalo and others where large plants are located, the factory production no doubt has immediate effect on local enterprises, but this is not necessarily a certain indication.

But in the cities where motor vehicles are built in large numbers from the factories is reflected an expression of satisfaction and confidence as to the business in prospect. With hardly an exception there is activity and faith in increase of orders. The manufacturers have sought to equalize the demands upon their facilities during the entire year and those who have equipment for the production of power wagons believe that it will be possible to so apportion each class as to afford a supply almost if not quite equal to demand.

The progressive distributors have in a like manner endeavored to stimulate business by bringing to the attention of the people as a whole the most recent productions. This was attempted for several years at the opening of the season in New York, but this same idea has been applied in Chicago and other western cities with exceedingly good results.

As to the autumn business as experienced in different sections of the country it may be said that there has been improvement as compared with other years. Throughout the eastern commercial centres, especially in larger cities, the disposition is to give orders early for spring delivery and to drive this season's machine through the winter weather. There is never, save in rare instances, willingness to utilize a new machine for winter service unless it be a closed car, but there has been in many communities of proportions a tendency to use the automobile throughout the year. With the dealers whose businesses warrant, a profitable policy has been to adapt body equipment to service conditions, and exploitation of closed types for cold and stormy weather has been productive to a surprising degree.

The use of the automobile for every purpose is increasing rapidly in the South. The roads are by no means what they are in the North and East, but touring has been remarkably promotive and there is undeniably an enthusiasm for good highways that will be especially stimulative of the use of the motor vehicles. The same is true of other sections of the country, especially the Northwest. All sections of the

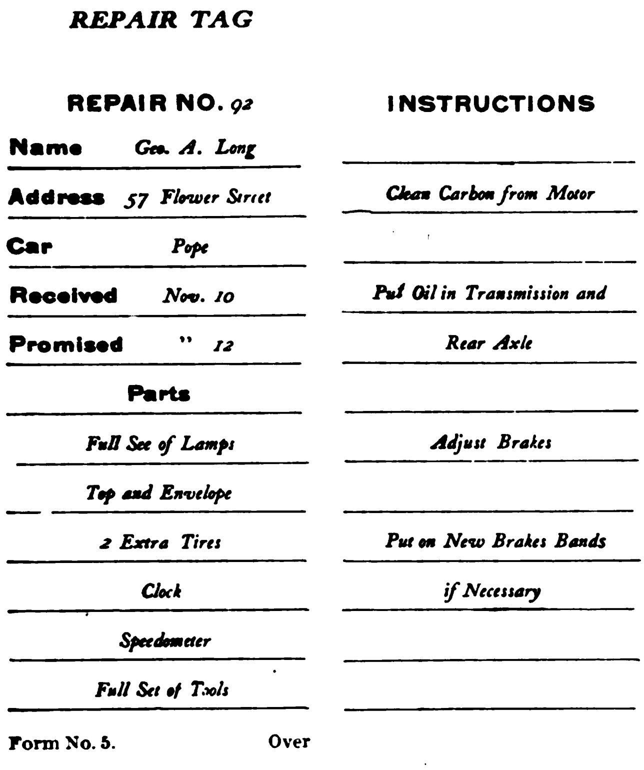
Middle West are utilizing the power conveyance more generally than ever before, and the Pacific Coast market, never small, has been materially increased.

The possibilities for export have never been seriously exploited by the makers of motor vehicles of America, although some of the manufacturers have undertaken to compete with the industries of Europe, but it is a fact that the development of the industrial wagon has presented the opportunities in new light. There appears to be little doubt that, as the United States has always been one of the leaders in building of agricultural machinery and vehicles, it is entirely reasonable and logical for the larger concerns to enter into the foreign markets with the same energy and methods that have been successful, with such adaptations as may be necessary in meeting the changed conditions.

The requirements for foreign service differ considerably as compared with domestic needs, but this is understood and careful study of essentials ought to bring about productions that will not only be satisfactory in cost, expense of upkeep and maintenance, but in hard and continuous use. Of course in the building of these classes of machines the industrial or manufacturing result would be locally and nationally manifested.

EXCLUSIVE REPAIR SHOP SYSTEM A SUCCESS.

The repair shop exclusively for motor vehicle service, in which work of any kind may be undertaken and performed to a standard of workmanship, is the exception today. There may be general supposition that such an enterprise would not have the patronage that would be justified; that the charges for the work would be excessive, and that there might be prejudice from the assumption that being separate from any car agency "accommodation" would not be accorded. As a matter of fact there is nothing more of a drain upon a business nor anything so inimical to good service as unsatisfactory attention and absence of the protection that is assumed should be provided.



REPAIR TAG

REPAIR NO. *92*	**INSTRUCTIONS**
Name *Geo. A. Long*	
Address *57 Flower Street*	*Clean Carbon from Motor*
Car *Pope*	
Received *Nov. 10*	*Put Oil in Transmission and*
Promised *" 12*	*Rear Axle*
Parts	
Full Set of Lamps	*Adjust Brakes*
Top and Envelope	
2 Extra Tires	*Put on New Brakes Bands*
Clock	*if Necessary*
Speedometer	
Full Set of Tools	

Form No. 5. Over

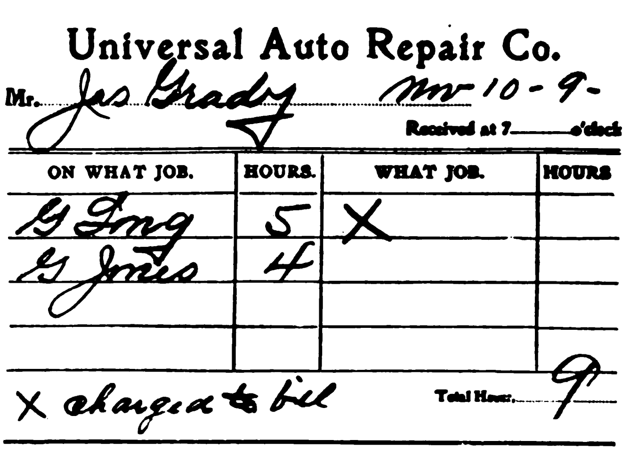
Form No. 1—Repair Tag.

Repair shops are not all well equipped and systematized. Perhaps the majority can be improved in both respects. Naturally the purpose is to make the least investment commensurate with the service established, yet to give the best that is possible with the equipment. There must naturally be a possibility of expansion and the future must be considered to some extent. Satisfactory shelter must be had for all the cars on which work is progressing, and there ought to be reasonable storage space. These, however, are details which are separate from the shop organization, with which it is proposed to deal.

There is no reason for any person other than the workman, working on a car once it has been placed in the hands of the repairer, and this when required by rule establishes a shop responsibility for tools and supplies; that is, control of every possibility for leak is entirely in charge of the management.

A system that has much to commend it is that adopted at the formation of the Universal Auto Repair Company, Hartford, Conn., which concern leased the repair shop connected with the Miner Garage after it had been given over by Mr. Miner as being unprofitable. The members of the company were three practical mechanics, who had been connected with the Pope Manufacturing Company, and thoroughly experienced with all classes of motor vehicle work. The firm was created with the view of having each partner supervise a part of the work, working with and directing the men, one of them giving whatever time was necessary to the office detail.

The firm established a policy that included charging good prices for the work, guaranteeing satisfaction to the customers, treating the men with a view of developing the business, and economizing wherever possible. It was further decided that advertising would be the only expense that could not be minimized. In connection with the policy it was decided that no work should be undertaken by the job, unless it was understood that the estimate was an outside figure and if the work did not reach this in the aggregate the customer was to receive the benefit. In other words if an estimate were made this was not the charge if the total value of the service was less, but under no circumstances was a sacrifice made. This was found to work out satisfactorily in practise and the patrons found they were paying for what they received, and no more.



Universal Auto Repair Co.

Mr. Jas Grady Nov 10 - 9 -

Received at 7 ____ o'clock

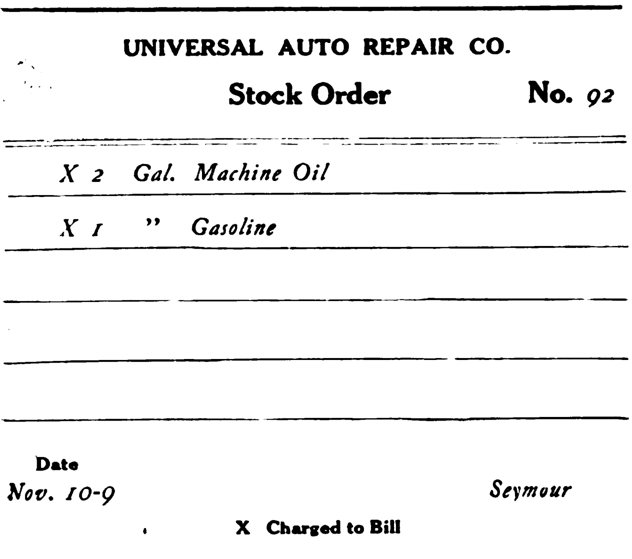
ON WHAT JOB.	HOURS.	WHAT JOB.	HOURS
G Long	5	X	
G Jones	4		

X charged to bill

Total Hours 9

Form No. 2—Time Card.

The company did not deal in accessories. It made a point to obtain whatever was desired and gave the benefit of experience in selection of what was the most desirable equipment. The location in the garage building was found to be beneficial in that a transient business was attracted, but the chief purpose was to give a thorough and high class service to garages that did not do repairing. That the firm was composed of reliable men was an important factor in developing business and this organization had no difficulty in inspiring confidence.


UNIVERSAL AUTO REPAIR CO.

Stock Order **No.** *92*

X 2 Gal. Machine Oil

X 1 " Gasoline

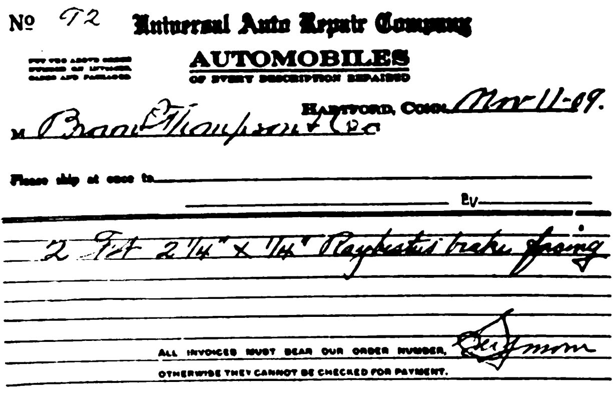
Date
Nov. 10-9 *Seymour*

X Charged to Bill

Form No. 3—Stock Room Order.

Shop organization was the principal task when business was begun. To create a system that would minimize the office work and yet insure accuracy and results was imperative, and this developed what may be applied to every shop, whatever its proportions. This system has the merit of extreme simplicity and efficiency. Incidentally it should be said that good machine tools were indispensable, this reducing resort to specialists, and each workman was supposed to furnish his own kit of hand tools. The shop tool room was well stocked and for this the checking plan was adopted. The stock room was supplied with carefully selected materials to meet all ordinary requirements.

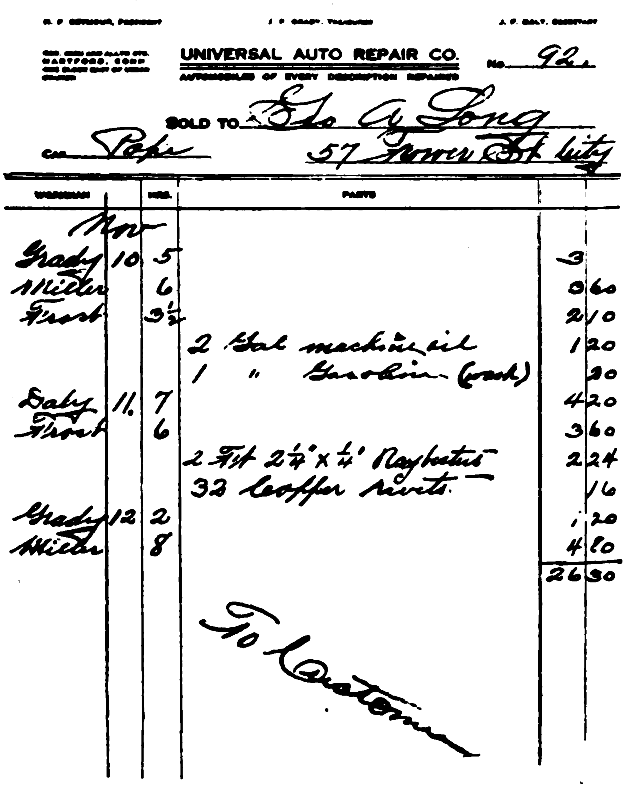
That the system may be made perfectly clear to the reader it is proposed to follow a job through the shop and to note the record made. The books kept by the office are a cash book, journal and ledger, which are supplemented by the original records, which are preserved and are instantly available for reference.


№ 92 Universal Auto Repair Company
AUTOMOBILES
OF EVERY DESCRIPTION REPAIRED
HARTFORD, CONN. Nov 11-09.
M Bran Thompson & Co
Please ship at once to
By
2 Ft 2¼" x ¼" Raybestos brake facing
ALL INVOICES MUST BEAR OUR ORDER NUMBER, Seymour
OTHERWISE THEY CANNOT BE CHECKED FOR PAYMENT.

Form No. 4—Stock Order.

Each job received is given an order number, which will be apparent by reference to the repair tag and instruction, which is a heavy manila card 6.25 by 3.25 inches. This tag is filled out and it contains data as to name, address, make of car, and the date received, which is transcribed from the tag to the bill. The tag is the memoranda and the bill, made in duplicate upon a blank sheet, shows all but the printed matter on the bill. The tag is then consulted by the head of the work room and on the reverse is written the instruction which outlines certain work and with whatever incidentally may be regarded as necessary.

The work is begun on the car and during the first day three men work 14 1-2 hours, and they use two gallons of machine oil and a gallon of gasoline for washing the parts. The oil and gasoline are delivered from the stock room for which receipt is given by Seymour. The stock order is given the same number as the order, and this order identity is preserved through the shop. The stock orders and the time cards for each day are taken to the office at the end of the day and the following morning are examined and checked and filed. The time card, which is indicated by a single form, shows that James Grady, for instance, worked nine hours during the day, five of which was the job for which the order number is 92, which is identified by the name of the car owner on the ticket, for additional accuracy. The form of blank is self-explanatory. The stock room order is also taken and it is found that on the same day the gasoline and oil were delivered. By further reference to the bill form appended it will be noted that from the time cards and stock room orders each bill is filled out daily and brought to the minute. When the charge is made on the bill the duplicate is also made and this gives a complete record. The time card is shown as Form No. 2.


UNIVERSAL AUTO REPAIR CO. No. 92
AUTOMOBILES OF EVERY DESCRIPTION REPAIRED
SOLD TO Geo A. Long
CAR Pope 57 Flower St City

WORKMAN		HRS.	PARTS		
Nov					
Grady	10	5		3	
Miller		6		3	60
Frost		3½		2	10
			2 Gal machine oil	1	20
			1 " Gasoline (wash)		20
Daly	11	7		4	20
Frost		6		3	60
			2 Ft 2¼" x ¼" Raybestos	2	24
			32 Copper rivets		16
Grady	12	2		1	20
Miller		8		4	80
				26	30

To Customer

Form No. 5—Completed Bill.

The stock room order and receipt is a voucher for the charge as well as being a record for the delivery of stock. It is shown as Form No. 3.

The following day, the second the car is in the shop, two men work upon it 13 hours, time cards accounting for this. But to reface the brake bands lining is necessary, which is not carried in stock. This calls for an order, which is made on a local dealer in this case, specifying what is necessary, bearing the job order number. The original is sent Brown, Thompson & Co., and aside from the firm heading and the note at the foot of the blank is identical with the duplicate. The order is retained by Brown, Thompson & Co., and the duplicate is sent to the office. This is shown as Form No. 4.

Another order is made upon the stock room for 32 copper rivets. The third morning the charges for time and for stock ordered and from the stock room are entered upon the bill as before. This day two men work eight hours upon the car and this is similarly charged. The car was in the shop the morning of the fourth day, but is called for by the owner. When he asks for his bill it is ready and waiting for him, complete. In the event of a charge being questioned the time cards and the stock room orders are instantly available, and the record of the order given outside. The bill can be re-checked from the record if desired. From the stock orders is shown the shrinkage in the stock while the outside orders indicate the amounts due by the firm for any reason whatever.

The bill as completed is itemized and the original is sent while the duplicate is retained, this being in loose leaf binding and indicates each bill remaining unpaid. As each nut, cotter or any other supply is charged and accounted for it is understood the books required are few indeed. The records are preserved on file by month and may be consulted instantly. The form of bill is indicated and it will be seen that with all transient business as cash and comparatively few accounts it is possible to keep very close oversight of every bill by reference to one file. The completed bill is shown as Form No. 5.

It may be noted that each bill contains a record of every order upon stock or outside and the price charged.

Should there be a car sent into the shop for overhaul and where there is more or less work to be performed, the order is given number and the date, make of car, car registry number, name of owner and address, and then instructions are written in detail the order being 10 by 5 inches and made in duplicate on a heavy manila card. The original is retained in the office and the card is attached to the car, and then the process is as has been outlined. This blank is used only for winter overhauling and general long repairs and is filled out in detail.

As has been stated this system is admirably simple, it gives the results, it requires but little time, it safeguards the company and the customer, includes every desired fact, and indicates precisely a transaction with regard for every requirement of business. It has given satisfaction with a few or a considerable number of men.

YOUR EXPERIENCE WITH YOUR BUSINESS.

Profit or Loss Dependent Upon Organization and System Judiciously Applied--What Will Yield Economy and Perfect Garage Service.

With many the establishment of the garage is the outcome of demands made upon the agent for the repair and maintenance of the cars he has sold. It is a logical conclusion that the distributor is in a position to supply parts needed for restoration and repair, and this demand by customers forces the stocking of whatever may meet ordinary requirements. Adjustments and attention similarly impel a repair service, and the accommodation of car owners who have no private garage brings about the public station.

There are instances where the garage and the repair shop are a separate enterprise, each entirely apart from the other, neither of which is agent nor broker of cars, and again some agencies have neither garage nor repair facilities. There are those who believe that the most profitable business would be the three divisions in combination. Others assume that the greatest success might be with two instead of three, and still another class believes that the divisions ought to be separate businesses.

It is obvious that to a certain volume of business, however, the repair shop can combine garage service, and, perhaps, the sale of certain staple supplies, because collectively the transactions are profitable, and without all it would not be possible to continue. The need of sheltering the cars when under repair compels at least a fair degree of protection and floor space, which naturally leads to accommodation and eventually constant service.

The combining of the business seems logical, and yet there is a point where it would appear best from the viewpoint of many to divide or separate the departments. Of course much depends upon the local conditions. It may be assumed that systematizing ought to be adopted and consolidation perfected. But as the business may fluctuate widely with the seasons this may not be advisable. Just where the separation should take place, if determined, must also be largely dependent upon circumstances of which the agent must be the judge.

In small or suburban communities there may be the more reason for the combination garage, and in the cities and populous localities the division could be more readily effected. This is another condition that must be carefully weighed in any conclusion reached. For the purpose of obtaining the opinions of those who may have had experience and whose views have substantial foundation the editor of the ACCESSORY and GARAGE JOURNAL invites contributions from readers, these to be not more than 600 words in length, and which review the proposition as described. For the most meritorious of these a price of $5 will be paid, and $3 and $2 respectively for the second and third in point of excellence. The opinions should be submitted within 30 days and should be addressed to "Garage Department," the ACCESSORY and GARAGE JOURNAL. The names of the authors of the articles chosen will be announced in the January issue.

WHAT CLASSES OF CARS SHOULD A DEALER SELL?

One of the greatest problems for agents for pleasure and industrial cars is the choice of vehicle. There are varying opinions as to the character and price of the machine which can be sold to the best advantage commercially. The prices and types are varied broadly. Many men sell one car only, some two, others a greater number; some believe it best to direct attention to one line of endeavor alone; others affirm that two machines of different prices will at least double the market of the locality, and that this policy is well established.

The agent naturally seeks to sell the greatest number of cars he can. There is a limitation to his own and his salemen's endeavors and to the attraction of the single car to the motoring element of the community. If he has one line of cars at what might be a moderate selling price the supposition is that he has the greatest field. If the price of the line be more or less the prevailing belief is that the market contracts or expands with the initial values. There are, of course, makes of cars which include a number of models ranging from low to medium, but these are the exception and not the rule.

Often an agent for a car well established in the community reaches a conclusion that he might broaden his market should he take on another make, this to sell at a price to meet either an extreme or another distinct class. It is the wisdom of choosing another car, and what car will give the best results with the first car sold, that is discussed with much care and thought. While it is true that much depends upon the prosperity of the community or section there are well defined business principles that are applied. This subject may be divided into several topics: Is one car or several cars (makes) the better proposition? If more than one what should be the variance as to price? If three or more how may they be best graduated as to price? Is one or more sales organizations the better policy? Does adding another line of cars lessen the combined expense of selling? Does the division of endeavor lessen the attention to the original line?

To these suggestions ought to be added consideration of the greater attraction and its selling value, for advertising is essential. The readers of the ACCESSORY and GARAGE JOURNAL are invited to express their opinions in articles of not more than 600 words, stating what reasons justify the sale of but one or two or more cars, what classes of cars (market value) appear to be the best for a combination agency, what car by market value would be best combined with an extremely low or a high priced car, and under what circumstances could two cars of approximately the same price be sold.

For the article which has the greatest merit a price of $5 will be paid, and for the second and third best $3 and $2 respectively will be paid. The articles must be submitted within 30 days and should be addressed to "Agency," the ACCESSORY and GARAGE JOURNAL. The names of the authors of the articles decided as best meeting the requirements will be published in the January issue.

WHAT IS THE PROFIT OR LOSS ON EACH CAR SOLD?

Nothing is more vital with any business enterprise than knowledge of profit and loss. Methods which will establish the dividing line between success or failure are regarded as sufficient by many. The supposition is that such information will make possible whatever modification is necessary to insure a reasonable revenue. But this is all generalities and there is nothing specific and definite. Some men are of the opinion that it is best to departmentize a business and to keep the accounts of each department separate, with, of course, general accounting covering an entire business. Such a system applies well enough to some forms of business, such as repairing, garage service, and the sale of accessories, but with the sale of cars there is lack of definite knowledge unless there be careful record of every detail from the time of making the deposit for the car until after the period for any guarantee has elapsed.

Some cars are ordered, shipped, received and delivered without the expenditure of a cent more than minimum cost. With others the delivery period is one succession of expense. The matter of expense is assumedly to be borne by the manufacturer, the agent and the purchaser, and there is a disposition to economize responsibility. All of this is decidedly unsatisfactory in that no precise condition is established for the government of any or all.

It has been found by some of those who have carefully analyzed their business that this variance of expense materially lessens the profits on some of the cars sold, naturally affecting the revenue in this respect. It is not possible to regain such loss, and as an insurance against the possibility of such event it is believed wise to consider each separate car as an entirely different proposition. That is, that an account should be opened with each particular machine and that this should not be closed until the agent is satisfied there will be no further demand made upon him.

There is special value to a detail accounting with each car in that this will establish the value of each repair or service in connection with its sale, and record of this character will make it a comparatively easy matter to find the aggregate cost of selling and, naturally, the exact profit. Where no system of record exists there is nothing that can be regarded as definite.

There are some instances where the cost of selling a single car has been several times the entire commission on the car, and this must be taken out of the general receipts of the business, it not being possible in any other manner to make up the loss. There are innumerable reasons for shrinkage in commissions and the only manner possible for eliminating such causes and consequently economizing the cost of selling is to know exactly the expense attached to the sale of each machine, whether this may be a cash or an exchange proposition.

This subject may be discussed broadly or with a view entirely toward means of systematizing the sales methods and the service to be given to a customer. It is of such importance that the editor of the ACCESSORY and GARAGE JOURNAL invites the readers to submit articles dealing with it and looking toward practical solutions. These articles should not exceed 600 words and should be submitted within 30 days to "Sales of Cars," the ACCESSORY and GARAGE JOURNAL. For the three most meritorious, $5, $3 and $2 will be paid in the order of merit. Any forms necessary should be roughly sketched so that the ideas may be represented in connection with the articles. The names of the authors of the articles given the preference will be published in the January number.

WHAT SYSTEM WILL BEST SERVE GARAGE PURPOSES?

Record is one of the most valuable assets. To have value record must be complete and systematized. Incomplete it is practically worthless. To be thorough does not mean a record or system should be cumbersome or complicated. Simplicity and full results are possible and practical. One of the greatest causes for unprofitableness in the average garage is the loss of property or time through theft, neglect, or incompetency and mismanagement.

Disregard for the property of others is an inherent disease and this can only be offset by a record that will establish responsibility without question. Any form of record means more or less clerical work and an accumulation that may seldom, if ever, be referred to. To minimize the labor of making and in reference it is necessary that there be a reduction of every note or entry to bare facts.

In garages where the number of employees is small there is even less regard given to system. There is an absence of responsibility that is reflected in the service and such condition may drive away patronage and prevents development, a serious result, to say nothing of the immediate loss.

There are any number of reasons for failure of the garage owner or manager to make a profit and innumerable explanations may be made, but while it may be that the business cannot be entirely successful under prevailing conditions it is absolutely certain that loss cannot be prevented unless causes are known. Only through careful inquiry and record is it possible to ascertain where savings may be made.

It may not be wise to make application of record to every detail of the business, but to apply system or record where suspicion has been aroused or attention has been directed cannot be injudicious. This might be adopted with reference to some particular case or condition with a view of establishing fact. On general principle, however, it is certain enough that it would be best to know every detail of the business.

Cost of installation and labor of maintenance are the two factors to be considered. The expense is to be offset by the general saving to be made. The simplest is the better, all else being equal. But conditions differ so greatly that it is difficult to devise what might be applied to all specifically. It is entirely practical, however, to create what can be modified or adapted to meet with the needs of the average garage of moderate proportions.

With a view of obtaining suggestions that may be useful to the readers of the ACCESSORY and GARAGE JOURNAL the editor invites the preparation of brief articles dealing with this subject. For the most meritorious of these a price of $5 will be paid, and for the second and third meritorious $3 and $2, respectively, will be paid. These articles should not exceed 600 words and, if essential, may be accompanied by rough pencil outlines of the forms or blanks that are necessary for the record.

All contributions of this character should be submitted within 30 days, and should be addressed to "System," the ACCESSORY and GARAGE JOURNAL. The names of the authors of the articles selected for merit will be published in the issue for January.

STANDARD WOVEN FABRIC COMPANY.

When the Standard Woven Fabric Company, Worcester, Mass., succeeded to the business of the Multiple Woven Hose & Rubber Company last March the company was organized with capital of $400,000 under Massachusetts law, and acquired the equipment, patents, etc., of the old concern. The officers chosen were: George D. Moore, president and works manager; W. B. McSkimmon, vice president; A. H. Burdick, treasurer and general manager; T. H. Daley, secretary and clerk; J. H. Drury, A. T. Baldwin, both of Boston, and the officers, directors. Mr. Moore was secretary of the original company.

The company owns valuable patents covering its products, chief among which are solid multiple woven cotton belting, specially treated; solid multiple woven hose fabrics and Multibestos brake lining and friction materials. The Multibestos products were placed in the market about six months since and are woven by special machinery from brass wire and asbestos yarn. The chemical treatment was originated by Dr. Moore, who is technical expert for the company, and produces a singularly superior quality of materials.

The company has plans making for the production of new products and for the erection of a factory that will double its manufacturing capacity, in keeping with a policy to broaden its activities and facilities. With the experience of the executives and the character of the products it is anticipated that the company will be a decided factor in this industry.

INCANDESCENCE CAUSES ENGINE TROUBLE.

Faulty spark plug construction, as indicated by pre-ignition, is sometimes a very baffling cause of engine trouble on account of the deceptive symptoms accompanying it, such as slowing down of the motor and indications of serious loss of compression. The trouble is due to the fact that there may be a fine wire extending beyond the central metal core of the spark plug, and owing to the fact that it is well concealed within the shell, the diagnosis of the ailment is particularly difficult. When this projecting piece, which serves no useful purpose, becomes incandescent, it ignites the gas before the spark occurs and causes pre-ignition in a like manner to red hot particles of carbon or any minute metal projections in the combustion chamber. The remedy is to take the plug apart and cut off the electrode flush with the edges of the central core, being careful not to leave any ragged edges when the job is completed, and then bending the remaining wire so it will have the proper air gap between its end and that of the insulated core.

NEW MEXICAN RUBBER PLANTS.

Vice Consul Richard M. Stadden of Manzanillo, Mexico, reports that an American resident of that district has been experimenting in rubber-producing plants for some years, with the result that he has discovered a tree, a vine and three plants which yield first class crude rubber. These plants are said not to have been botanically classified as yet and are known only by their Indian names. Analyses have been made of each in the United States, and it is claimed that each resulted successfully. Mr. Stadden says:

"The tree is of quick growth and can be propagated from slips put in the ground. Limbs that were thrown in the shade and left for six months germinated, and on being planted took root and are now growing well. Trees planted from slips will be large enough to prune in three years; limbs cut from the trees furnish the rubber; pruning can be done every year. This tree produces about six per cent. crude rubber.

"The three plants referred to grow wild and can be reproduced from the seed. In three years they become well rooted. The plant, being then from four to six feet in height, may be cut to the root each year, using the cuttings for extraction of the rubber, leaving the root to recover itself and produce the same each year. The mode of cultivating these plants is about the same as for corn; they will produce eight per cent. crude rubber.

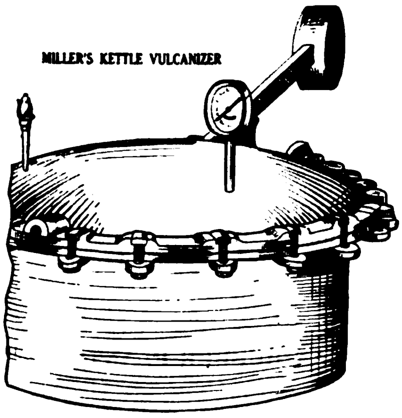
"The vine gives a free crude rubber with no gum. It grows in the shade, extending over the surrounding trees, and is the richest in rubber, giving 10 per cent. of the crude commercial product. Experiments in the cultivation of this vine are now being carried on.

"The discoverer is conducting experiments in different processes of the extraction and coagulation of the milk from these plants and vine and tree, and states that he will be able to produce crude commercial rubber for about 15 cents gold per pound."

BELT SLIPPING OBVIATED.

A remedy advocated to obviate in a great measure the troublesome tendency of a flat belt to slip in wet weather is that of wrapping the pulley with tape, taking care to wind it in the opposite direction from which the pulley runs, so it will not unwind when the engine is in motion. Owing to its large surface area it is not necessary to wrap the rear pulley. The tape, of course, will wear in time and will need to be renewed, but while it lasts the belt will hold as well in wet weather as in dry.

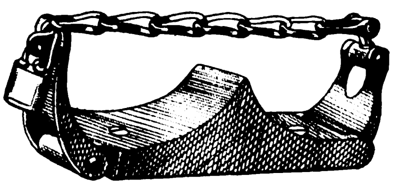
ACCESSORIES AND APPLIANCES THAT SELL.


MILLER'S KETTLE VULCANIZER

Miller's New Steam Vulcanizing Kettle is shown in the accompanying illustration and is intended to hold entire shoes. In any kind of vulcanizing work on casings, there will come a time when one has to be retreaded or needs a large patch which extends beyond the reach of the smaller sectional forms. Then, the kettle type is desired. That depicted in the sketch is made in two sizes by Charles E. Miller, Anderson, Ind. The smaller weighs but 2000 pounds and holds from five to eight tires at a time, up to a total height of 38 inches. Of course smaller shoes could be placed within large ones and thus increase the capacity, but for more work, the larger form, which weighs 2500 pounds and holds from seven to 10 tires, is recommended. This has a total height of 44 inches, 16 per cent. greater than the first named. Every large shop handling tire repairs should have sufficient work of a big nature to call for one of these two sizes. They operate entirely by steam, the cover being fitted with a gauge and safety blow-off.

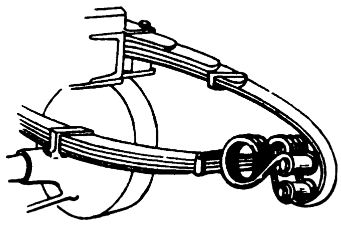
* * *

B-A Tire Locks are made by the B-A Auto Specialty Company, New York City, in answer to the demand for a simple but positive preventative for the theft of spare tires when carried on the car. Ordinarily, these are held by a couple of small straps, and it is only necessary to slash a knife across these, the work of a single second, to make them removable. A large number of extra shoes have been surreptitiously taken from automobiles in this manner, so many in fact, as to bring about the detachment of a special squad of plain clothes men in the metropolis to look after this alone. The device mentioned and shown in the sketch herewith not only holds the tires normally in which it replaces irons and straps, but also prevents their loss. The locking device consists of a stout case hardened chain which is fixed at one end and passed through a hasp at the other. A Yale lock then makes everything secure, and the owner safe in his possession of the key. The company guarantees this specialty for five years. It is made in a number of different forms and sizes.


B-A TIRE LOCK

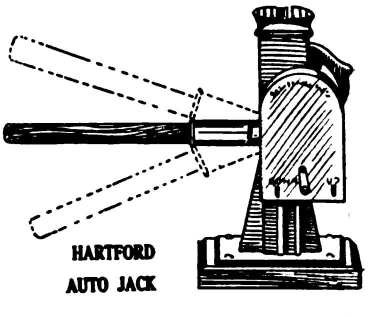
* * *

Acme Torsion Springs are of an auxiliary, shock absorbing nature, a pair of them customarily being added to the rear springs of the car. When used there or on the fronts, the back is chosen invariably. They consist of a series of three full circular coils, the ends of which turn up on one side and down on the other. Using a pair of these together, the two upper portions are held beneath the bolts on the side spring, while the two lowers are caught by the spring horn, or frame bolt, or in the case of a three-quarter elliptic member, between the ends of the bolt at the lower extremity of the upper portion or third quarter. In effect this combination eliminates all road shocks, so that the passenger rides without bounce or jounce. The smaller members take up the slighter shocks, and the usual side springs the larger ones. They are made by the Acme Torsion Spring Company, Boston, Mass.


ACME TORSION SPRINGS

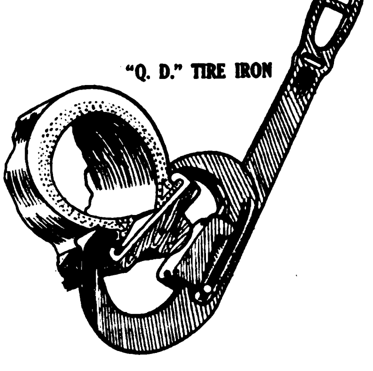
* * *

The Hartford Auto-Jack is intended to dispense with considerable of the back-breaking labor connected with raising a car off the floor or ground. To this end, a compound mechanism is utilized, so that the operator gains the benefit of increased leverage. In this way, the same weight is lifted an equal distance with less effort. It is said by the maker, the Hartford Suspension Company, Jersey City, N. J., that in a test a 4000-pound car required 90 pounds effort on the ordinary jack and but 30 with a Hartford. The casing is of tough malleable iron, the lifting rack cut from steel, while the steel gears are machine cut and hardened. Excellent material and workmanship make an article which is long lived, and efficient throughout its duration. This, combined with the lessened manual labor required should more than compensate for a small difference in price. The lessening of work done in jacking a car can easily be figured in considering a road accident where the machine slips off a highly crowned road into a soft, muddy ditch. Here the gain is little each time.


HARTFORD AUTO JACK

* * *

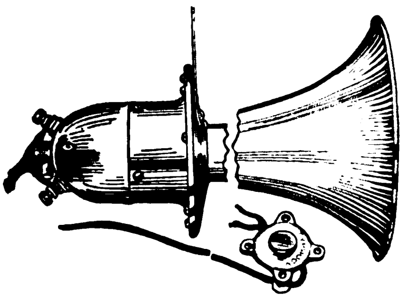
The Quick Detachable Tire Iron is a new tool for use with demountable, detachable or clincher rims, and is made by the Brookline Motor & Specialty Corporation, Brookline, Mass. This is produced with shaped faces which prevent the destruction of tires, either carelessly or unavoidably. It is so made, as the drawing shows, as to give the operator a very powerful leverage, by means of which tires that have rusted fast to the rims may be broken away with no other tools. In this respect, it should effect a great saving, for many tires which have become rusted fast and then punctured or blown out, are cut off in order to save the rims. With this tool, the shoes are saved also, and with little or no extra expense. It will be noted that the second or loose arm of the operating end is


"Q. D." TIRE IRON

fastened to the body of the tool by means of a pin passing through a hole. There are a number of these, permitting the movement of this part to suit larger or smaller tires, and thus making it an universal tool.

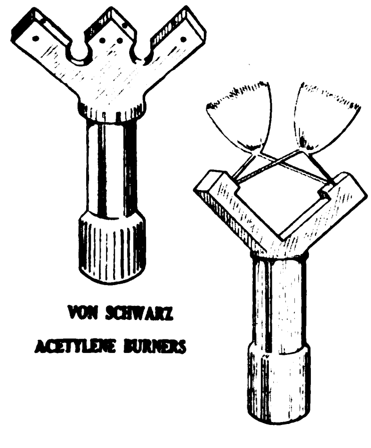
★

Typhoon Motor Driven Horns have been placed upon the market recently in response to a widespread popular demand for a low priced electric signal. It is the product of five years' experimental work upon the part of the maker, the Typhoon Signal Company, Chicago, Ill., and has two swinging arms revolving with the axis of the motor, which hit a set of interrupters, thus actuating a hammer to strike a diaphragm. By centrifugal force, these are retarded so that when the motor is in full action, the extraordinarily rapid motion of this little hammer produces a powerful blast at each stroke. This combines into a low, strong, deep signal that warns without frightening, while there is no internal wear. That the latter is a fact may be noted from the company's guarantee for two years. The current consumed is said to be a maximum of but two amperes on a six-volt circuit, making it very economical.


TYPHOON ELECTRIC HORN

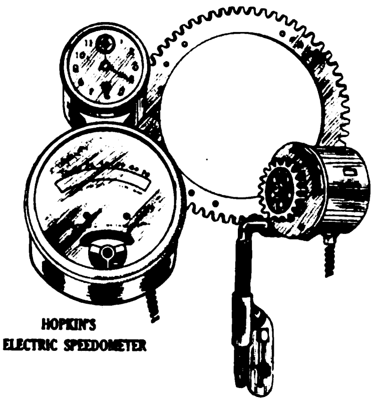
★

Von Schwarz Burners are intended for the better class of searchlights and lamps utilizing acetylene as a fuel. With the great increase in the use of this gas during the last year or so, has come a corresponding call for a better burner; one which will not only give a superior light but will not clog readily, and when wholly or partially closed will clean easily. In answer to this demand, M. Kirchberger & Co., Second avenue and East 22nd street, New York City, has brought out a number of different styles. The two shown in the sketch on this page carry the trade names, Searchlight and Twin, the former being shown at the left, and the latter at the right and slightly lower down. Both are twins actually, the Searchlight form having the two flames produced in parallel and in the same plane, while the other has two sources of light on two planes inclined slightly together, being perhaps .125 inch apart at the lava and about three times that at the apex.


VON SCHWARZ ACETYLENE BURNERS

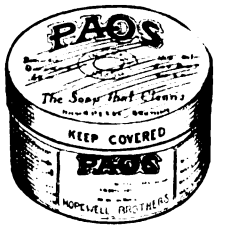
★

The Hopkins Electric Speedometer is a mileage measuring device which operates on an entirely new principle. It is well known that when a system of coils of wire is rotated within a permanent magnetic field, an electric voltage or potential is generated which is in direct proportion to the speed of rotation. In this accessory, made by the Electric Speedometer Company, Washington, D. C., advantage is taken of this by placing a small magneto generator on one of the front wheels, and gear driven from it. An indicating voltmeter is located on the dashboard, with a two-wire insulated cable connecting the two. By calibrating the latter in terms of the speed, a reading in miles an hour is obtained without the usual flexible shaft for transmitting rotations direct. To protect the lead wires from mechanical injury, they are covered with a flexible brass conduit, but the maker lays strong accent upon the fact that the whole system has no moving shaft to give trouble or make noise. An additional feature of this instrument is that it may be placed anywhere on the car with no more trouble than lengthening the cables. Due to its electrical action, the device is not affected by extremes of temperature. The usual trip, season and clock accessories are available.


HOPKIN'S ELECTRIC SPEEDOMETER

★

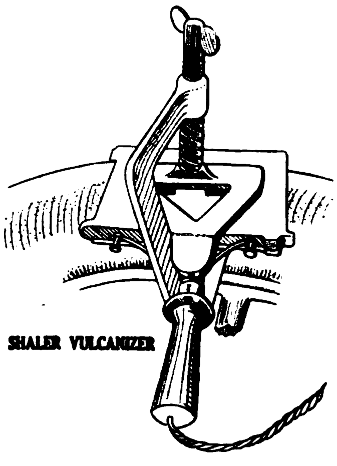
Paos, the new toilet soap, made by Hopewell Bros., Newton, Mass., while intended primarily for motorists would be equally useful to anyone having such work to do as would soil the hands. This, like all of the products of this concern, is made to sell on its merits, the name itself being taken from the word soap turned around, or as the maker phrases it, "Soap spelled backward, but a step forward in soap." It is a pure material, for washing, combined with a scourer, a detergent and an emollient to produce an aseptic cleanser. In use it forms a profuse lather, while due primarily to the emollient which it contains, the skin is left soft and with an agreeable feeling. A slight scent adds to the pleasure of its regular use. In color, it is white, and is put up in cans, about 3.5 inches in diameter and perhaps two inches high, the drawing herewith giving a good idea of the appearance.



HOPEWELL SOAP. PAOS

★

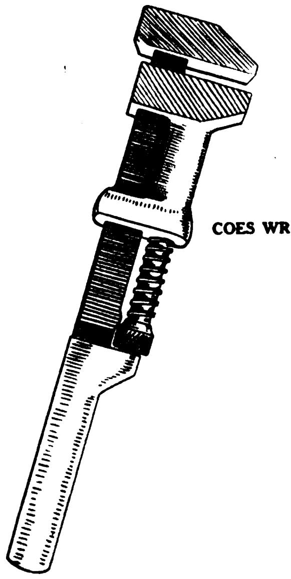
Shaler Vulcanizers, one form of which is shown in the drawing, are intended to prolong the life of tires and reduce the up-keep bills by attending to small injuries in either tube or casing before they have extended beyond the repairing point. They are made in a number of styles, sizes and shapes by the C. A. Shaler Company, Waupum, Wis., one of the largest makers in the country. The instruments are designed to utilize flame, steam or electricity, that shown being of the latter type, and arranged for direct current, such


SHALER VULCANIZER

as the ordinary lighting circuit. This makes it possible to screw in the plug and do the work of repairing the tire surface while engaged elsewhere at other tasks. A prominent man who has used one of the Shaler portable direct current outfits for two years, comments on it as follows: "Before I had the device, I expected tire trouble every time I took the car out, but there is no longer any danger of accident or inconvenience from blow-outs on the road. I have done away with them by keeping all stone and glass cuts sealed up, thus preventing weakening and rotting of the fabric. I do not carry an extra casing now, while my tires last three times as long, and repair bill nil."

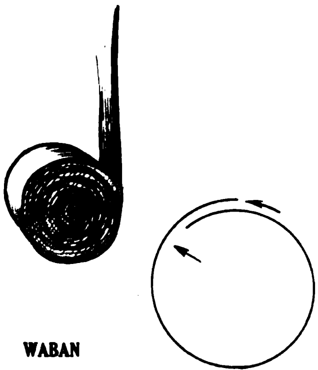
★

Coes Wrenches are known wherever mechanics are required, this tool having been a standard of excellence for some 50 years. Of late, considerable attention has been paid to the automobile trade, and all of the company's experience brought to bear on the production of a few models which would be serviceable to the motor car user more perhaps than any other form, but in addition carry all of the Coes ideas of material, workmanship and design. The result of this combination has been the production of a wrench which is almost unbreakable and cannot be worn out. It is claimed by the maker, that this product is 30 per cent. stronger. A rigid system of shop inspection, in which the components or finished articles pass through no less than 16 hands, insures that the material and work are up to the standard set. The simplicity of the construction is such that the number of parts is a minimum. One of these should be in every tool box. The maker is the Coes Wrench Company, Worcester, Mass.



COES WRENCH

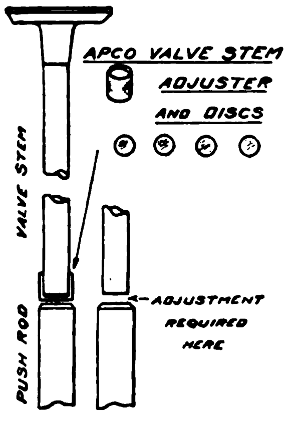
Bullet Proof Webbing is made by the Waban Webbing Company, Boston, Mass., for use, among other things, as an inner tube protector. When utilized thus, a strip of the fabric about one-quarter longer than the tube's circumference is wound around it and overlapped, as sketched herewith. For this specific use, the cloth is made of a correct width and shape so as to apply readily. It is a heavy woven material, substantially equal to five thicknesses of canvas, except that it is woven in a single piece. To avoid all possibility of requiring a smaller inner tube, the fabric is said to be very fine, while the edges are woven thin, with the web sinking into itself where the lap is made. From actual experiences, this form of tube strengthener gives 5000 to 7000 miles of rough riding, which is considerably in excess of usual tire mileages.



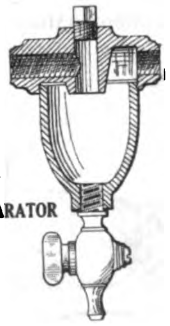
WABAN
BULLET PROOF WEBBING

★

Apco Valve Stem Adjusters, made by the Auto Parts Company, Motor avenue, Providence, R. I., are hardened steel caps to fit over the valve stems of cars not equipped with adjustable valve lifts, such as the Maxwell, Ford and E-M-F. With each set is furnished a quantity of steel discs to take up wear as necessary. Worm valve stems and pushrods cause noisy operation and loss of power. These adjusters can be fitted in an hour and will last as long as the car. They are guaranteed to be satisfactory or the purchase price will be refunded.



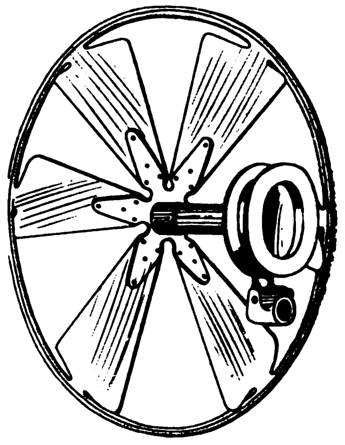
The Leavitt Gasoline Separator is a small but very serviceable accessory for the fuel supply system, which will save its cost many times over in the course of a season. It is made from brass by the Uncas Specialty Company, Norwich, Conn. The whole thing comprises but two parts, the filter and the well. These are connected by a taper thread so that no packing to come loose or give other trouble is needed. As the cut shows, the gasoline flows in at one side, down into the well, thence through the gauze strainer and out to the engine. It is customary practise to place these on the underside of the running board or at any other low point, so that the greater weight of the water will help the filtering action of the brass screen.



LEAVITT
GASOLINE SEPARATOR

★

Sparks - Withington Fans are made by the Sparks-Withington Company, Jackson, Mich., for cooling or assisting in cooling automobile engines. They are made from pressed steel, with a heavy wire rim over which the ends of each blade are turned. The drop forged hub carries a place for a small bearing, while, if desired, an extension arm and driving pulley also may be attached. This concern turns them out in large quantities, and its shipping facilities are of the best. The sketch depicts one of the so-called one-piece designs, but this may be modified in any particular to suit special cases.



SPARKS-WITHINGTON FAN

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to deal in motor cars, accessories, etc.:

Eureka Seat Company, Buffalo, N. Y.; capital, $10,000.

Union Garage Company, Adrian, Mich.; capital, $20,000.

K-R-I-T Motor Sales Company, Detroit; capital, $15,000.

Detroit Electric Company, Camden, N. J.; capital, $25,000.

The Joseph Cormier Company, Cleveland, O.; capital, $2000.

Sheridan Park Garage Company, Chicago; capital, $5000.

Munger Automobile Company, Dallas, Tex.; capital, $2500.

City Auto Repair Company, Hartford, Conn.; capital, $50,000.

King Automobile & Repair Company, Charleston, S. C.; capital, $5000.

National Motor Starter Company, Grand Rapids, Mich.; capital, $10,000.

Cayce-Jones Motor Car Company, Louisville, Ky.; capital, $10,000.

Overland-Rochester Company, Rochester, N. Y.; capital, $30,000.

Mechanical Rubber Tire Company, Jersey City, N. J.; capital, $100,000.

Creston Auto Company, Grand Rapids, Mich.; capital, $4000.

Green Bay Motor Company, Green Bay, Wis.; capital, $25,000.

Smith Gasoline Meter Company, New York City; capital, $350,000.

Stone Harbor Garage & Marine Railways Company, Camden, N. J.; capital, $75,000.

Merchants Motor Car Company, 530 Essex building, Newark, N. J.; capital, $500,000.

Clenol Manufacturing Company, Muncie, Ind.; capital, $10,000; incorporators, George Lewis and others.

James G. Barclay, Inc., Buffalo, N. Y.; capital, $25,000; incorporators, J. G. Barclay, G. M. Kohl, E. Barclay.

Harbeck Motors Company, Chicago; capital, $50,000; incorporators, A. T. Ewing, E. S. Hartman, C. Bednor.

Heater Muffler Company, Elmira, N. Y.; capital, $50,000; incorporators, W. Kinzie, L. D. Curran, A. G. Ingham.

Sterling Top & Equipment Company, Jersey City, N. J.; capital, $50,000; incorporators, F. Grundy, W. C. Rands, G. Copp.

Manhattan Top & Body Company, New York City; capital, $50,000; incorporators, G. B. Radford, H. Schuler, C. D. Heintze.

Madden-Copple Company, Indianapolis, Ind.; capital, $1000; incorporators, Thomas Madden, Elbert Copple, Thomas E. Madden.

The S. R. Manufacturing Company, Schenectady, N. Y.; capital, $50,000; incorporators, Christian Steenstrup, Karl M. Rossi, Ralph J. Ury.

Baker Bros. Motor Company, Buffalo, N. Y.; capital, $10,000; incorporators, Edward A. Green, Edward H. Baker, Clarence W. Baker.

International Motor Company, New York City; capital, $10,000,000; incorporators, Richard S. Aldrichs, Graham Foster, Joseph A. Bennett.

Frank A. Reeve Company, Montclair, N. J.; capital, $50,000; incorporators, Frank A. Reeve, John Butler, David H. Slayback.

The Evergreen Motor Car Company, Evergreen, Conecuh County, Ala.; capital, $2000; incorporators, C. P. Deming, E. W. Dunn, R. L. Whitcomb.

Amplex Motor Company of New England, Boston; capital, $25,000; incorporators, Isaac B. Spafford, William M. Turner, William B. Foster.

Osgood Motor Car Company, Brooklyn, N. Y.; capital, $10,000; incorporators, Samuel Miskind, 178 Hewes street; Paul W. Smith, Irving J. Joseph.

The M. D. Moore Manufacturing Company, Waveland, Ind.; capital, $2000; incorporators, M. D. Moore, J. W. Robertson, J. R. Sharp, J. D. Fisher.

Memphis Motor Car Company, Memphis, Tenn.; capital, $12,500; incorporators, J. T. Fisher, D. M. Armstrong, A. Goodman, Walter L. Berry, T. K. Cresson.

Baker Taxicab Company, Dayton, O.; capital, $10,000; incorporators, George L., Frank R. and Harry W. Baker, John Van Deman, Charles D. Heald.

Fear Naught Company, New York City; capital, $100,000; incorporators, R. T. Hughes, J. M. Davis, F. C. Munson.

Blackburn-Allen Company, Dayton, O.; capital, $30,000; incorporators, E. E. Allen, W. J. and M. A. Blackburn.

The Aquilas Aeroplane Company of Astoria, Brooklyn, N. Y.; capital, $5000; incorporators, John B. Felicetti, Gennaro Bescigno, Charles Fity.

Derby Automobile Race Company, Los Angeles, Cal.; capital, $100,000; incorporators, A. F. Scherfenberg, J. E McReynolds, C. I. Reynolds, O. V. Traggard.

Snora Motor Horn Company, New York City; capital, $50,000; incorporators, A. F. Foshay, G. Goldman, H. Neubardt.

Moran's Garage & Auto Company, Jersey City, N. J.; capital, $25,000; incorporators, W. A. Higgins, O. R. Moran, J. E. Moody.

Ross Machine Company, Lafayette, Ind.; capital, $15,000; incorporators, William, David E., Linn C. and Edward A. Ross.

American Roller Bearing Company, Camden, N. J.; capital, $100,000; incorporators, V. A. Murray, L. A. Myers, D. Bellinger.

Divine Tire Demonstrating Company, Utica, N. Y.; capital, $10,000; incorporators, Bradford H. Divine, Edmund D. Munson, T. Harvey Ferris.

Reliable Tire Repair Company, Peoria, Ill., 633 Main street; capital, $2400; incorporators, John V. Leslie, George Haas, Bert A. Fritz.

Weaver Aviation Company, New York City; capital, $10,000; incorporators, John Weaver, Indianapolis, Ind.; George G. Johns and H. W. Kelly, New York City.

Rio Grande Automobile Company, El Paso, Tex.; capital, $5000; incorporators, Max Moye, W. F. Carter, Jr., John M. Wyatt.

Sea Island Tire Company, Cleveland, O.; capital, $15,000; incorporators, J. C. Brooks and others.

The Spring Tire Company, Brooklyn, N. Y.; capital, $8000; incorporators, Henry B. Hill, William Eiermann, William A. Crane.

Gordon W. Turner Company, Boston; capital, $5000; incorporators, Gordon W. Turner, Robert A. Jordan, S. Inez Stone.

Nowata Motor Car Company, Nowata, Okla.; capital, $2500; incorporators, Walter K. Campbell, George Godron, Stanley J. Campbell.

The Consolidated Motor Company, Fayetteville, N. C.; capital, $25,000; incorporators, H. Lutterloh, J. U. McKethan, Benjamin McMillan.

Gilson Auto Company, Portland, Me.; capital, $10,000; incorporators, L. C. Gilson, president; George D. Pustorins, treasurer.

States Auto Supply Company, Oskaloosa, Ia.; capital, $50,000; incorporators, D. P. McClure, C. W. Payne, O. W. Watland.

Atlantic Vehicle Company, New York City; capital, $10,000; incorporators, Philip A. Carroll, 22 East 47th street; Joseph F. Dempsey, Eugene A. Donohue.

Paul Lacroix Automobile Company, New York City; capital, $10,000; incorporators, Paul Lacroix, 353 West 85th street; Harry U. Kibbe, Harvey T. Andrews.

New Bedford Elastro Company, New Bedford, Mass.; capital, $20,000; incorporators, George S. Taber, president; Manuel J. Senna, treasurer; Frederic H. Taber, Abbott P. Smith, Henry C. Mosher.

Pathfinder Motor Car Company, Chicago; capital, $10,000; incorporators, T. C. Vawter, Charles H. Lott, Edmond W. Pottle, George J. Meier, Corn Exchange building.

Donaldsonville Garage & Automobile Supply Company, Ltd., Donaldsonville, La.; capital, $10,000; incorporators, James P. Kock, president; K. A. Aucoin, vice president; A. A. Sarradet, secretary; Adolphe Netter, treasurer.

Heathman-Solliday Motor Company, Dayton, O.; capital, $20,000; incorporators, Frank B. Heathman, Charles H. Solliday, Grace B. Heathman, Zora Y. Holliday, Joseph D. Chamberlain.

Grasberger Vehicle Company, Richmond, Va.; capital, $50,000; incorporators, J. A. Grasberger, president; J. E. Sorg, vice president; Robert N. Wildbore, secretary and treasurer.

Premier Motor Company, Charleston, W. Va.; capital, $25,000; incorporators, W. R. Clifton, A. C. Osborn, H. A. Wilder, B. J. Ross, C. S. Forkum, P. M. Moore, L. H. Pyle, C. H. Martin.

International Aeronautical Construction Company, Augusta, Me.; capital, $100,000; incorporators, E. M. Leavitt, president and treasurer; Frederick Hale, Portland, Me., clerk.

Simplex Automobile Sales Company, St. Louis, Mo.; capital, $20,000; incorporators, J. D. Wooster, Edward

A. Faust, C. Drummond Jones, Knox Taussig, Thomas S. McPheeters.

Tompkins, Creedon & Co., Utica, N. Y.; incorporators, William Townsend, D. P. and Ella Creedon.

New England Aviation Company, Kittery, Me.; capital, $1,000,000; president, Leon G. Chase, Boston.

Pioneer Motor Car Company, Marietta, O.; capital, $18,000; incorporators, F. E. Bosworth and others.

Robinson Automobile Company, Charleston, S. C.; capital, $10,000; incorporators, J. T. and B. F. Robinson.

Cutting Motor Sales Company, Youngstown, O.; capital, $5000; incorporators, J. B. Ditchon and others.

Blevins Motor Sales Company, Lima, O.; capital, $5000; incorporators, H. W. Blevins and others.

Jackson Tri-State Motor Car Company, Louisburg, N. C.; capital, $25,000; incorporators, R. Y. McAden, H. D. Woolcott, Agnes Lacy.

Kentucky Auto & Machine Company, Paducah, Ky.; capital, $5000; incorporators, F. M. Fisher, W. F. Paxton, R. G. Fisher.

Providence Motor Car Company, Providence, R. I.; capital, $25,000; incorporators, John A. McDonald, William H. McSoley, Alice Stanton.

The Auto Lighting Company, Springfield, Mass., will remove to Holyoke, Mass. The company is capitalized for $30,000.

Cherokee Automobile Company, St. Louis, Mo.; capital, $2000; incorporators, William Paffrath, N. F. Schneider, W. J. Kennedy.

Hollander Motor Company, Boston; capital, $15,000; incorporators, George W. Wetherbee, president; Wilkie B. Hollander, W. Newton, Robert A. Jordan.

Overland Automobile Company, Dallas, Tex.; capital, $25,000; incorporators, W. W. Davis, D. T. Finley, F. M. Bannell.

A. Rookus, St. Louis, Mo., has taken out a patent for a motor truck and is organizing a company to manufacture the vehicle in that city.

S. & D. Motor Vehicle Company, Oakland, Cal.; capital, $280,000; incorporators, Carlos Schmidt, B. E. Duckworth, A. A. Montague.

Brooklyn & Hudson Auto Lamp Works, Brooklyn, N. Y.; capital, $2000; incorporators, Harry Adellman, Julius Posternack, Jack Samas.

New England Sales & Equipment Company, Boston; capital, $10,000; incorporators, E. M. Leavitt, president and treasurer; Lewis A. Burleigh, clerk.

Norton Taxi Motor Company, Providence, R. I.; capital, $100,000; incorporators, Michael W. Norton, Francis I. McCanna, Lafayette L. Safford.

Chickasaw Motor Car Company, Chickasaw, Tenn.; capital, $25,000; incorporators, Carroll P. Cooper, Simpson T. Speers, J. W. Leftwich, N. H. Martin, R. B. Nibhut.

Gregory-Condor Motor Company, Columbia, S. C.; capital, $20,000; incorporators, W. T. Gregory, president; T. J. Harper, vice president; W. S. Hough, secretary; John W. Condor, treasurer.

WITH THE MANUFACTURER

The U. S. Ball Bearings Manufacturing Company, Oak Park, Ill., announces that Denton & Flagg of Cleveland, O., will have the exclusive selling rights of the U. S. annular bearings.

The Velie Motor Vehicle Company, Moline, Ill., through its Chicago branch, recently closed an agency for the Velie line of pleasure and commercial vehicles in La Porte county, Ind.

E. C. Morse, sales manager of the Hudson Motor Car Company, Detroit, has returned to that city after a trip abroad and will again take up his duties.

The White Company of Cleveland, O., reports that its New York branch shipped three pleasure cars to Rio de Janeiro, Brazil, recently.

Harry J. Debear, well known to the automobile trade in New York City and Philadelphia, and to the industry through his connection with the daily press, has become affiliated with N. Lazarnick, the motor car photographer of New York City.

C. S. Henshaw of the New York branch of the E. R. Thomas Motor Car Company, Buffalo, N. Y., announces the appointment of the Newton-Humphreyville Company, Newark, N. J., as Thomas agent.

The Gilbert & Barker Company, Springfield, Mass., maker of gas engines, has begun the work of laying out the ground plan of its new plant at the corner of Cold Spring avenue and Union street.

W. C. Hood, sales manager of the Metzger Motor Car Company, Detroit, is making an extended trip through the West in the interests of the Everitt line. He reports business in good condition.

The Acme Carburetor & Manufacturing Company, Dayton, O., has been incorporated for $10,000 by Charles S. Barkalew, W. H. Johnson, E. L. McCallay, Lester Carson and Charles E. Margerum.

The Republic Rubber Company, through its board of directors, has decided upon an issue of $1,000,000 preferred stock and the stockholders will meet at Youngstown, O., Nov. 10, to confirm the proposition.

Eugene L. Downs, manager of the agency department of the Simplex Automobile Company, New York City, left recently on a tour that will embrace 16 states for the purpose of demonstrating a 36 horsepower Simplex to dealers and others.

Fred Bradfield, recently with the Jackson Automobile Company of Grand Rapids, Mich, has accepted a position with the Chicago branch of the Velie Motor Vehicle Company, Moline, Ill.

The Hamilton Rubber Company, Trenton, N. J., announces that ground has been broken for the erection of a new mill adjoining the present location. The structure will be 60 by 180 feet, three stories and of brick.

The Findeisen & Kropf Manufacturing Company, Chicago, has awarded a check of $200 to Ralph Mulford, driver of the Lozier car in the Fairmount Park races, Philadelphia, in accordance with its offer to the winning drivers using the Rayfield carburetor.

George A. Thomas has joined the sales force of the New York branch of the E. R. Thomas Motor Car Company, Buffalo, N. Y. He is well known to the automobile industry and was until recently assistant to the factory sales manager, George Fitzsimmons.

The ArBenZ Car Company, formerly the Scioto Car Company, Chillicothe, O., maker of ArBenZ cars, calls attention to the change of name adopted recently owing to the fact that there has been some confusion in correspondence, resulting from the old designation.

George L. Lloyd of the Velie Motor Vehicle Company, Moline, Ill., who was in San Francisco, Cal., recently, appointed the Auto Sales Company as western distributor of the Velie line to succeed the Standard Motor Company.

Paul Smith has been appointed sales manager of the E-M-F Company, Detroit. He was formerly located at Indianapolis, Ind., and is well known in the automobile industry. Although a young man he is thoroughly conversant with the practises of the business.

The Locomobile Company of America, Bridgeport, Conn., has opened a southern branch with headquarters at Atlanta, Ga., which will be in charge of Frank P. Day, formerly connected with the sales department of the company.

The California Motor Company, Oakland, Cal., has secured 12 lots on High street and will establish and equip a plant to manufacture a car known as the Pacific Special. Representatives of this concern secured the indorsement of the Oakland Chamber of Commerce.

Claude S. Briggs, who organized the K-R-I-T Motor Car Company of Detroit, and who later became general manager of the Brush Runabout Company, has resigned that office to assume the presidency and general management of the new concern which will make a popular priced car known as the Detroiter.

The Henderson Motor Sales Company, distributor of the Cole line, has taken a five years' lease of space in the new $60,000 concrete building being erected at Capitol and Michigan avenues in Indianapolis, Ind. The structure was especially designed for automobile service and will be completed about Feb. 1.

The Cleburne Motor Car Manufacturing Company is the name adopted at a recent meeting of the stockholders of an automobile concern at Cleburne, Tex. The following board of directors were elected: J. E. Poindexter, Brown Douglass, George A. McClung, S. B. Norwood, T. N. Brown, O. L. Bishop, Robert E. Gatewood, A. V. Barber, Judge J. M. Moore and R. H. Crank. The latter is to act as secretary.

The Penn Motor Company's new plant which is to be located in East Newcastle, O., is under way, ground having been broken recently. The main building will be 60 by 510 feet and will have six wings, each 60 by 150 feet. The structure is to be completed by Jan. 10.

The American Locomotive Company of New York City, in accordance with its plans for a branch house system, has appointed George Hudson of the Hudson-Colby Company, Boston, resident manager of the Alco. He has taken charge with new salesrooms at 567 Boylston street and the maintenance station will be in Cambridge. Heretofore the Alco account has been handled by C. F. Whitney of the Park Square Auto Station.

F. J. Tyler, superintendent of sales for the United States Motor Company, New York City, announces that F. H. Lucas, who for a number of years was connected with the Stoddard-Dayton interests and for the past year sales manager of the Park Square Auto Station, Boston, has been appointed general manager of the retail department for New England. E. P. Weber has been appointed general manager of the wholesale department. The direct factory branch with salesrooms and service department will be at 664 Commonwealth avenue, Boston.

The Henderson Motor Sales Company, Indianapolis, Ind., distributor of the Cole line, made by the Cole Motor Car Company of that city, announces the following new agencies established: The Auto Company, 411 San Jacinto street, Houston, Tex.; H. S. Knickerbocker, Worcester, Mass.; Snow Hardware Company, 36 Union street, Rockville, Conn.; R. S. Withers, Jackson, Miss.; J. F. Payne, Gulfport, Miss.; C. M. Bennett, Westfield, Ill.; F. Burrours, 158 Thatcher Place, Decatur, Ill.; William F. Forbes, Richmond, Va.; Penn Auto Company, Scranton, Penn.; Burk Motor Car Company, Chattanooga, Tenn.; C. A. Winter, Wellsville, Kan.; Fred Bihl, 220 Dolorosa street, San Antonio, Tex.; Philadelphia Motor Company, Philadelphia, Van Duyn & Mathias, Springfield, Ill.; Economy Auto Company, Oskaloosa, Ia.; E. S. Kinley, 410 Jackson street, Topeka, Kan.; E. Garber, Washington, Ill.; Thibaut Motor Company, Napoleonville, La. A change has been made in the Mount Vernon, N. Y., representative, the new agent being the Hennings Auto Garage.

Daniel Iseminger, well known to the automobile trade, has accepted a position with the Velie Motor Vehicle Company, Moline, Ill., and will make his headquarters at Chicago. He will travel in Indiana and Ohio.

The Columbia Lubricants Company, New York City, maker of Monogram oil, is mailing a pocket card, on one side of which is printed the S. A. E. horsepower formula and the rating of motors from 2.5 to six inches. On the reverse are tables by which speeds and times may be computed at a glance.

The Republic Rubber Company, Youngstown, O., has established a factory branch at Golden Gate avenue and Hyde street, San Francisco, Cal.

The Lozier Motor Company, Detroit, maker of Lozier cars, announces that negotiations have been completed whereby the concern will be represented in Canada by the T. Eaton Company of Toronto and Winnipeg.

The Firestone Tire & Rubber Company, Akron, O., at its annual convention in that city last month, entertained the branch managers and salesmen. A photograph was taken in front of the company's new plant, which has 10 acres under one roof and a total floor space of 14 acres. It is equipped throughout with the latest and most modern machinery for insuring uniformity and perfection in the finished product. President Firestone in his address submitted figures showing that last year's increase in sales was the greatest in the history of the company.

The Waverley Company, Indianapolis, Ind., recently received an order for nine electric mail wagons from the government for use in St. Louis, Mo. Seven of these machines have been completed. They are of 2000 pounds capacity, but the remaining vehicles will carry 2500 pounds. Each car is designed to carry its full load a distance of 50 miles without recharging.

William T. Kincaid and Francis P. Scott, who with Marshall B. Martin heretofore composed the Kincaid Oil Company of Providence, R. I., have purchased Mr. Martin's interest and will continue the production of Kincaid oils under the same firm name.

GARAGE & DEALER

The Jons Motor Car Company, Oklahoma City, Okla., is occupying its new home at 13 Harrison street.

Rousseau Bros., Montreal, Can., has taken over the garage of the National Motor Company of Canada, Ltd.

Leo Fouchter and A. S. Jenkins have opened a garage and repair shop at Ironton, O.

C. W. Woodford has established a motor delivery and transfer business with headquarters in the garage of the Tanberg Auto Company, Eau Claire, Wis.

The Kline-Krit Company, Philadelphia, agent for the K-R-I-T car, has removed to 1405 Race street.

The White Motors Company, New Haven, Conn., has opened an office and salesroom at 1094 Chapel street.

The Auto Repair & Salvage Company, Hartford, Conn., is erecting an addition to its building on Orchard street.

The Southern Auto & Machine Company, 116 Rovert avenue, St. Louis, Mo., announces the opening of a new salesroom at 3031 Locust street.

The Elmira Motor Company, Elmira, N. Y., will remove from its present location to the Silsbee building, State and East Church streets.

J. W. Perry, has resigned from the O. J. Gude Company to join the sales staff of the Autocar Company of New York City.

A. W. Trevor has retired from the Yeggy-Trevor Motor Company, Rock Island, Ill., and the business will be continued by G. A. Yeggy.

The Lindsey American Sales Company has been organized by C. W. Lindsey at Dayton, O., and the salesrooms will be at Lakeside Park.

W. J. Donnelly, New York representative of the National Automobile Supply Company has returned after an extensive visit to the Middle West.

The Buick Automobile Company, Des Moines, Ia., has removed to 417 12th street, and will be managed by E. S. Reffensperger.

A. E. Bloom, formerly of the Riggs & Bloom Company, Springfield, Mass., has become associated with the Hampden Auto Company of that city.

E. R. Clark, Springfield, Mass., announces that his firm will be known hereafter as the Western Massachusetts Cadillac Company.

C. E. Christian, Kansas City, has taken charge of the Hupmobile branch which has been removed to 3013 Main street.

The Hupp-Yeats electric branch at Kansas City, Mo., is now occupying new quarters at 3501 Main street and is in charge of W. N. McWade.

The Automobile Trade Association of Buffalo, N. Y., recently tendered a farewell dinner to Norman E. Oliver, a member who leaves for New York City.

The A. J. Davies Company, Kansas City, Mo., has been appointed distributor for the Knox line, made by the Knox Automobile Company, Springfield, Mass.

L. K. Sribner of Truman, Minn., has purchased a tract of land in that city and will erect a garage and repair shop.

R. Wellington of Tyler, Minn., has purchased the interest of H. Brockway in the Tyler Auto Garage & Repair Shop.

The Bond Motor Company, Kansas City, has approved plans calling for the erection of a $60,000 garage at 1615 Grand avenue.

The Oscar S. Gear Automobile Company, Columbus, O., has taken the agency for the Oldsmobile, made by the Olds Motor Works, Lansing, Mich.

O. G. Roberts & Co., 933 East Gay street, Columbus, O., has closed contracts to handle the Overland line, made by the Willys-Overland Company, Toledo, O.

The Atlanta Automobile & Accessory Association, Atlanta, Ga., held its annual banquet recently at which plans for races on the local speedway were discussed.

The Stark County Garage & Machine Works, North Judson, Ind., is building a large garage. The proprietors are A. C. Ross and G. A. Spehner.

The New Tire Company is a recent addition on Van Ness avenue, San Francisco, Cal. N. C. Dunham is manager.

The Roberts-Toledo Auto Company, Toledo, O., is occupying its new home at the corner of Madison avenue and 11th street.

The Cutting Motor Sales Company, Youngstown, O., is established at 127 North West avenue. W. L. Dale is secretary of the concern.

S. Robistow has purchased the Rheume building on First street, Swanton, Vt., and will convert it into a garage and automobile livery.

The Pauly-Bruce-Goldaker Company has been formed to handle the Stoddard-Dayton line in Milwaukee and Wisconsin.

Frank A. Martin, formerly of Oskaloosa, Ia., has been made manager of the Brown-Corley-Ellis Motor Car Company of Des Moines, Ia.

The High Level Auto Company, Ashtabula, O., has been taken over by C. O. Smith, proprietor of the Smith House.

Martin & Wilson, attorneys, and A. Purdy of Davenport, Wash., have joined interests and organized a garage company.

The Spencer Automobile Company, Monongahela, Penn., has been sold to Samuel Cook and son, James B. Cook.

The Hager-Elliott Engineering Company, Nashville, Tenn., has opened its new garage at 605 McGavock street.

Frank Gotch, the well known wrestler, will enter the motor car field and will erect a modern fire proof garage at his home in Humboldt, Ia.

Paul H. McMullen, Oakland, Cal., agent for the Hudson and Hupmobile, will build a fire proof building at 1511 Broadway, which will be completed in November.

The Fred P. Warren Company has been awarded the agency for the Hudson car, made by the Hudson Motor Car Company, Detroit, in San Antonio, Tex.

The Kirkland-Hicken Company has been formed by W. J. Kirkland and George V. Hicken of Omaha, Neb., and will act as manufacturers' sales agent.

The Standard Motor Car Company of San Francisco, Cal., is making a considerable enlargement of its quarters at the corner of Golden Gate and Van Ness avenues.

The E. R. Wilson Automobile Company, Omaha, Neb., has taken the agency for the Paige-Detroit, made by the Paige-Detroit Motor Car Company, Detroit.

The Charles Shlear Motor Car Company, Fourth and Spring streets, Columbus, O., has taken the agency for the Hupmobile, made by the Hupp Motor Car Company, Detroit.

W. D. Meeker, who has been identified with the automobile business for many years, has taken up his new duties as manager of the Blue Ribbon Garage at Meriden, Conn.

The Penn Park Garage, Park and Mason avenues, York, Penn., has been acquired by Norman R. Galletin and Stewart E. Meyers, and the name changed to the Central Garage.

The Cummins Auto Sales Company of North Fourth street, Columbus, O., has closed the agency for the Everitt, made by the Metzger Motor Car Company, Detroit, in six counties of central Ohio.

The Central Auto Company has opened its new garage at Gettysburg, Penn. William F. Codori, Jr., is manager.

M. Abel, 165 North Fourth street, Columbus, O., has taken the agency of the Baker electrics for central Ohio.

J. H. Saris, Beloit, Wis., is remodelling the Skating Rink building on Broadway into a garage.

The Gareau Motor Car Company, Montreal, Que., has opened a new garage at 928 St. Catherine street.

The W. R. Sherin Company, Milwaukee, Wis., making a specialty of motor car painting, rebuilding and repairing, is occupying its new building at 547 River street.

The Motor Car Company, a new addition to Boston, has taken quarters at 94 Massachusetts avenue where it is showing the Nance "Six," made by the Nance Motor Car Company, Philadelphia Penn.

The Oregon Auto Garage Company, Albert Geiser, manager, and the Baker Auto & Electric Company, Baker City, Ore., have consolidated, Mr. Geiser having sold his interest.

Hite D. Bowman, Louisville, Ky., has completed a $7000 addition to his garage at Fourth avenue and Oak street. It will be used exclusively to charge, house and repair electric vehicles.

The Heilman Motor Car Company, Cummingsville, O., is erecting a new garage at Blue Rock street. The structure will be two stories in height and will accommodate about 40 machines.

The Speedwell Motor Car Company of California, San Francisco, has removed to new and larger quarters at 428 Van Ness avenue. The new location has the advantage of increased show rooms and a repair shop.

The Early Motor Car Company, Columbus, O., announces that it will discontinue the sale of motor cars and devote its attention to handling supplies and accessories. John E. Jones will be at the head of the new business.

The Fiat Automobile Company of Rhode Island has removed from Dorrance street, Providence, and is occupying its new building at 26-28 Snow street. This step provides larger and better quarters, and a service station has been established to insure prompt attention to the needs of Fiat owners.

The Cartercar Company, managed by the V. R. Hall Automobile Company, Cleveland, O., is occupying new quarters at 6111 Euclid avenue. This is one of the first automobile salesrooms on the avenue.

The Auto Trading Company, Pittsburg, Penn., is now occupying its new quarters at Center and Euclid avenues, East End. The officers consist of: President, E. Arch Cohen; vice president, Harry Ackerland; secretary, Nathan Hecht; treasurer, L. S. Levin.

E. A. Nelson, Springfield, Mass., has given up the agency for Buick cars, being succeeded by the Woodward-Reopell Company. The Norcross-Cameron Company has discontinued the Hudson line which has been taken over by the Hampden Auto Company.

Kimmell Bros., 215 North Fourth street, Columbus, O., has taken the agency for the Speedwell and Empire for 1912. Sub-agencies for the latter have been awarded as follows: Edward L. Felsom, Point Pleasant, W. Va.; Baker & Weaver, Dayton, O.

The Motor Import Company of Canada, Ltd., has been appointed sales agent in the Province of Quebec for the Pierce-Arrow cars, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y.

Frederick Purdy, for several years foreman in the shops of the Thos. B. Jeffery Company, Kenosha, Wis., has purchased the interests of the Kent brothers in the Kent Motor Car Company, and will hereafter conduct the garage on Church street.

Lawrence Kittell and Charles W. Collier have formed a partnership under the name of the Fox Motor Car Company and will open a garage and salesroom at 512 South Monroe street, Green Bay, Mich.

The Trade Credit Association of Chicago has admitted the following concerns to membership: Calmon Asbestos & Rubber Works, New York City; Federal Rubber Manufacturing Company, Cudahy, Wis.; Gulf Refining Company, Pittsburg, Penn.; Interstate Auto & Supply Company, Sioux City, Ia.; Lowe Motor Supplies Company, New York City; Marvel Carburetor Company, Indianapolis, Ind.; Union Auto Specialties Company, Pittsburg, Penn.

The Southern Auto & Machinery Company, St. Louis, Mo., has leased the sales and showrooms at 3033 Locust street, which were occupied recently by the Marathon Sales Company.

The Modern Auto Repair & Construction Company, St. Louis, Mo., has completed improvements whereby the concern is in a position to handle wrecked cars. Limousine and other types of bodies will be built.

Alexander Conquest, Perth Amboy, N. J., will open a garage and repair shop in the Redhing building. In addition to conducting a garage he will take the agency of several machines.

E. H. Webster and A. A. Jennings of Webster, N. Y., have succeeded the Lyons Automobile Company of Lyons, N. Y. The new owners take over all the rights and interests of the Marshall Barrick Company.

Ernest L. Gould, formerly of Owosso, Mich., a well known mechanic, has taken the position of superintendent of the Velie maintenance department in Cambridge, Mass.

H. A. Hennig and S. A. Lewis, Madison, Wis., have organized the Colby Motor Sales Company and will handle the Colby line as distributor for the State of Wisconsin.

Hugo Ohly, Jr., who conducted a garage on Jackson street, Sandusky, O., has purchased the Maxwell Auto Garage on Market street and will discontinue his former place.

The Wedge Garage has been opened on South Sixth street, Zanesville, O., with P. D. Gath as manager. The company is agent for the Maxwell, Columbia and Hupmobile cars.

C. B. Clements, formerly with the Howard Automobile Company, and later with the Goodyear Tire & Rubber Company, Akron, O., has secured a long term lease on the Fashion Garage at Grants Pass, Ore.

J. A. Murphy and Mark V. O'Neil have formed a corporation known as the Mark Motor Supply Company at 49 Fairfield street, Boston. The firm will act as manufacturers' agent and conduct a wholesale and retail business in accessories, etc.

The Barre Vulcanizing Company, Barre, Mass., is installing a new vulcanizing machine. A. E. Kenyon and William Dowd are the proprietors of the concern.

Lathrop & Smith, New London, Conn., announces the removal of its garage from Walker street to quarters formerly occupied by the Queen Anne mills. The former place will be utilized as a storehouse.

The Baker-Brewer Auto Company is the latest addition to automobile row in Indianapolis, Ind., that concern having the agency for the Baker electrics, manufactured by the Baker Motor Vehicle Company, Cleveland, O.

The Fernald Automobile Company, Denver, Col., announces that it has combined its salesroom and repair shop, and will occupy new quarters at 1216 Broadway.

D. A. Stormer and Albert Wilson have succeeded F. H. Strout at the Tremont garage, Tremont, Ill.

The Carolina Garage & Machinery Company, Raleigh, N. C., will be managed by W. H. Robbins, who purchased the plant recently.

The Maury Motor Company, Nashville, Tenn., has leased land on West Seventh street and will erect a new garage. The main show room will be 50 by 125 feet and the workshop 25 by 50 feet.

W. Herbert Bell, Lewiston, Me., will handle the Overland, Brush and Hudson for 1912 under the business name of the Bell Motor Company.

The Peck & Lines Company, Middle street, Bridgeport, Conn., agent of the K-R-I-T line, made by K-R-I-T Motor Car Company, Detroit, is demonstrating the 1912 model with success.

Irving Stern, New York City, has acquired the United States rights for the German-made Opel car and has established a salesroom at 52nd street and Broadway with E. B. Evans as manager.

H. P. Michael, Dayton, O., formerly with the Miami Valley Automobile Company, has taken the agency for the Hupmobile, made by the Hupp Motor Car Company, Detroit, and will establish a garage at 16 South St. Clair street.

The Canton Garage & Machine Company, Elmira, N. Y., will make a specialty of rebuilding automobiles this coming winter. The company, which was organized Feb. 1, is composed of L. A. Martin, H. P. Bruce and Q. H. Martin.

Frederick H. Tryon has secured the agency for Flanders and E-M-F cars, made by the E-M-F Company, Detroit, in Meriden, Wallingford, Cheshire and Prospect, Conn.

Harvey Parker, 141 Maynard street, Worcester, Mass., eastern distributor for Batavia tires, is making a brief visit to Pittsburg, Penn., and will return by way of Batavia, N. Y., where he will stop at the factory of the Batavia Rubber Company.

E. R. Wright and E. C. Haynes, Cortland, N. Y., have formed a partnership and will do an automobile business under the name of the Cortland Motor Car Company.

The Moon Motor Car Company of New England has been organized with Charles G. Andrews and M. A. Dykeman as the principal stockholders. The new company is located at 18 Columbus avenue, Boston.

The Auto Owners' Service Company, Indianapolis, Ind., a new idea in the garage line, is erecting a new building at 15 East Pratt street. It will be two stories in height, of yellow pressed brick with white trimmings. The floor space will accommodate 100 cars. The most modern appliances will be fitted including a vacuum cleaner. It is proposed to have the attendants uniformed.

Samuel W. Scott, formerly of Seaford, Del., has joined the sales force of the New England branch of the Velie Motor Vehicle Company, Moline, Ill., at Boston, and will take charge of the business in that district.

MECHANICAL POINTERS *for* GARAGEMEN AND OWNERS

MEASURING CYLINDER BORE.

It is not a difficult matter to measure the internal diameter or bore of an automobile cylinder when the latter is on the bench, but it is a problem of some magnitude to ascertain this information with some degree of accuracy when the cylinder is in its place on the engine base. An internal caliper by which the diameter of the bore may be quickly ascertained is shown at Fig. 1, this device having been patented by a London firm.

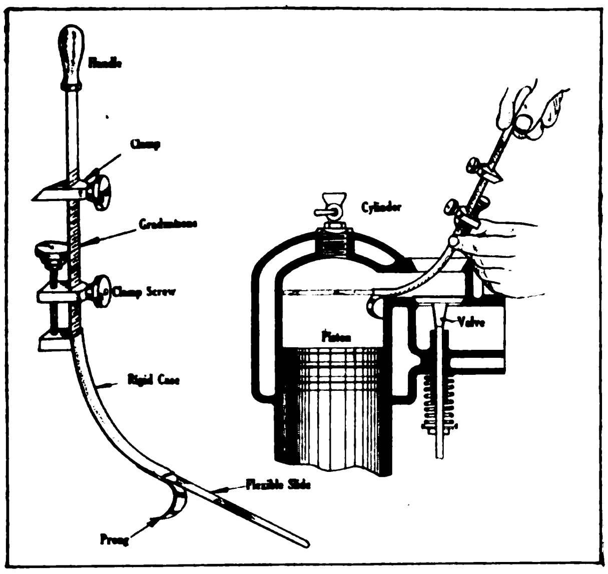

Handle
Clamp
Graduations
Clamp Screw
Rigid Case
Flexible Slide
Prong
Cylinder
Piston
Valve

Fig. 1—Measuring Cylinder Bore Without Removing It from the Engine.

A graduated flexible steel blade slides through a curved rigid socket which is provided with a steel prong at the lower end and a locking clamp at the other extremity. The end of the instrument is inserted through a valve port, in either an L or T head cylinder, and the curved prong is pressed against one of the cylinder walls. The graduated blade is pushed through the socket until its point is felt to touch the opposite side of the cylinder, when the diameter is at once indicated by the scale at the end of the socket.

While considerable dexterity is needed to take absolutely accurate measurements with this device, because of the liability of the flexible member to spring or the possibility of inserting the tool so the blade will be on an angle instead of parallel with the top of the piston, one may become very expert with practise. This measuring caliper is very valuable for officials at motorcycle, power boat or automobile races, to determine the bore of an engine in case of doubt. Another type is made that can be inserted through a spark plug hole or an overhead valve port when the engine has cylinders with valves in the head instead of at the side. The locking clamps and the adjustment screw permit one to retain measurements if necessary.

USEFUL COMBINATION TOOLS.

In endeavoring to reduce the number of tools needed by the mechanic, various inventors have designed combination tools in which several different utensils are grouped on one main element or handle. Some of these are complicated and not specially adapted to do any one thing well, and while they have diversified uses, they seldom appeal to the practical mechanic because of their cumbersome appearance and the difficulty involved in handling them. Some inventors have designed more practical tools, and a number of special combinations recently patented, which appear to have some value, are shown at Fig. 2.

The device shown at A gives one the choice of a hammer having the usual face and a flat riveting pein suitable for light work, a pair of pincer jaws and a divider or compass that may be utilized either in taking measurements or drawing circles, as the case may be. Each tool is thus distinct, and the form of the instrument is such that one could use any one without much interference from the others.

The soldering iron outlined at B is a very practical fitting that will appeal to the mechanic because of the large number of positions the copper bit may assume. This is provided at the lower end with a steel ball that fits a two-jaw chuck suitably formed to contain it. When one unscrews the handle, the

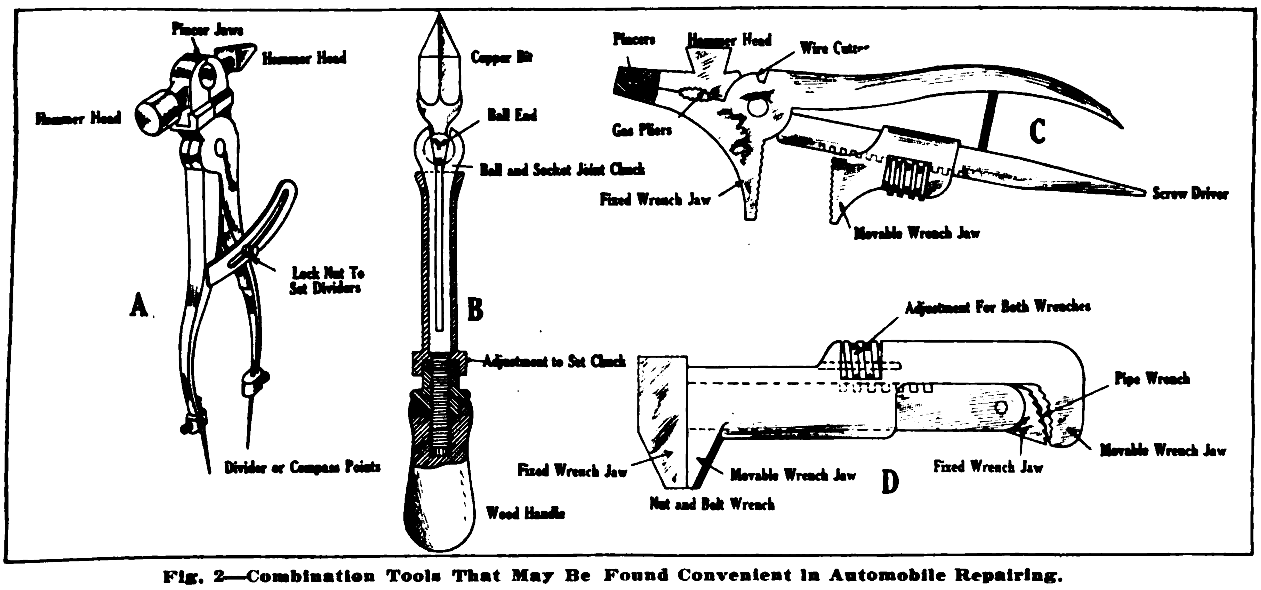

Pincer Jaws
Hammer Head
Hammer Head
Lock Nut To Set Dividers
A
Divider or Compass Points
Copper Bit
Ball End
Ball and Socket Joint Chuck
B
Adjustment to Set Chuck
Wood Handle
Pincers
Hammer Head
Wire Cutter
Gas Pliers
Fixed Wrench Jaw
C
Movable Wrench Jaw
Screw Driver
Adjustment For Both Wrenches
Pipe Wrench
Movable Wrench Jaw
Fixed Wrench Jaw
Fixed Wrench Jaw
Movable Wrench Jaw
D
Nut and Bolt Wrench

Fig. 2—Combination Tools That May Be Found Convenient in Automobile Repairing.

pressure against the ball is released and the bit can be set at any angle desired, after which the handle is turned in the reverse direction and the ball firmly clamped between the chuck jaws, thus holding the copper bit in place.

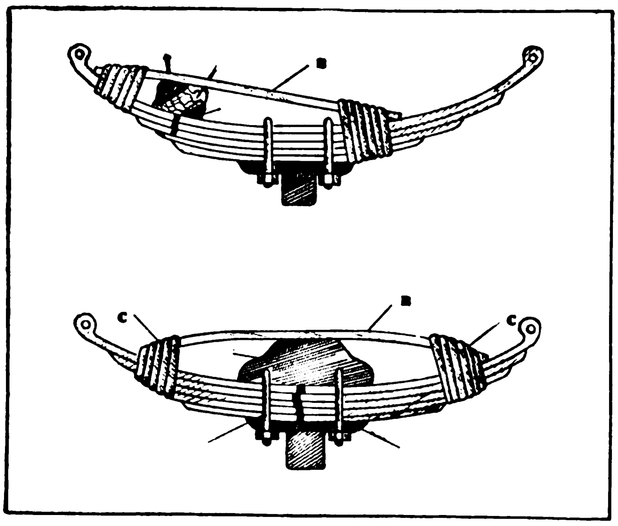


Fig. 3—How to Make an Emergency Repair of a Broken Spring.

That depicted at C offers a combinatnon of practical tools that should prove very valuable about the motor car or boat. One of the handles serves as a screw driver, and the back of it as a rack and support for the adjustable wrench jaw. The fixed and movable wrench elements are provided with serrated pieces, enabling one to use it either on pipes or bolts or nuts. Between the plier jaws a wire splicing groove is cut, and a serrated opening close to the fulcrum acts as pipe pliers if one desires. A wire cutter and hammer head are also provided.

The combination wrench illustrated at D combines in one simple tool two forms of wrench, both of which are thoroughly practical. The fixed portion of both nut and pipe wrench is formed by a forging having teeth cut on its back which the adjusting worm engages. The movable wrench jaws are a separate forging as indicated. One good feature of this wrench is that the handle length becomes greater as the opening between either set of jaws is augmented, this making for greater leverage at a time it is most needed.

TEMPORARY SPRING REPAIRS.

Considerable improvement has been made in spring construction resulting in increased elasticity of the metal employed, so that spring breakage is comparatively rare, being due generally to overloading or because of fatigue of the metal. Springs break in various places although most commonly in the centre between the spring clips or in proximity to these fastening devices as shown in Fig. 3. While these clips will hold a spring together, the ends are liable to sag and put a dangerous strain on the fasteners. An emergency repair can be made of a broken spring as indicated in the accompanying sketch.

A hardwood board B, from one inch to two inches thick, should be procured, and its sides trimmed so that it will be about five inches in the centre and two or three inches at the ends. Drive the nails CC in the ends of the board, lift the frame of the car by a jack to take the weight off the spring, put the centre of the board on the rubber bumper, or, if there be no bumper, on a block of wood. The ends of the board are then bound tightly to the springs with straps, wire or rope.

If the break be near the end as shown in the sketch, the block of wood should be nailed to the board over the break. The operation of fastening is practically the same as shown and described in the centre break. A repair can be made by interposing a large block of wood between the frame and axle, to take the entire weight. This remedy is practical when the spring is broken beyond repair.

SIMPLE ATTACHMENTS FOR WRENCHES.

Two useful attachments that can be easily fitted to the ordinary type of monkey wrench to make it suitable for working on pipe are shown at Fig. 4. That outlined at A is a simple pipe cutter comprising a jaw member having a recess to receive the jaw of the wrench, this being provided with parallel arms adapted to straddle the shank of the wrench. A cutting wheel or roller is mounted in a block sliding in and guided by a suitable yoke piece. This can be moved as desired by turning the handle on the feeding screw. Simple clamp screws insure that the attachment will be easily and quickly secured to the wrench. The pipe is placed between the movable jaw of the wrench and the roller, and is backed by the shank of the tool. The device is used in the same manner as a pipe cutter, the wrench being revolved around the pipe and the pressure on the cutter block being increased gradually to cut deeper into the pipe each revolution.

The device shown at B is an extremely simple member having a series of serrations or teeth to permit it to grip a round surface. This is made of hardened steel and has a simple clip member by which it may be easily attached to the fixed jaw of the wrench. The U shaped plate is adapted to closely engage the top and sides of the wrench jaw, the serrated plate is pivoted to the plate to lie beneath the face of the fixed member. A locking member composed of a pin having a grooved end and retention spring is passed through the U member back of the wrench shank to hold the attachment in place. The spring catch engages the groove in the pin when the latter is in position as indicated.

Notes on Wood Finishing—For all coarse grained woods that have to be filled it is best to put on, after filling, a thin coat of shellac, colored to suit the color of the wood. It acts as a binder, keeps the wood from changing its color and prevents the varnish from sinking too deep into the grain of the wood.

All coats of stain, shellac or filler need to be lightly sandpapered and cleaned of all dirt before putting on the finishing coats of varnish or hard oil.

All coats of hard oil or varnish should be rubbed with fine pumice stone mixed with linseed oil for egg stone and water for rubbing. For a polished finish, rub first with fine pumice stone and water and then shell gloss. For a dull finish, use powdered pumice with fine rotten stone and water.

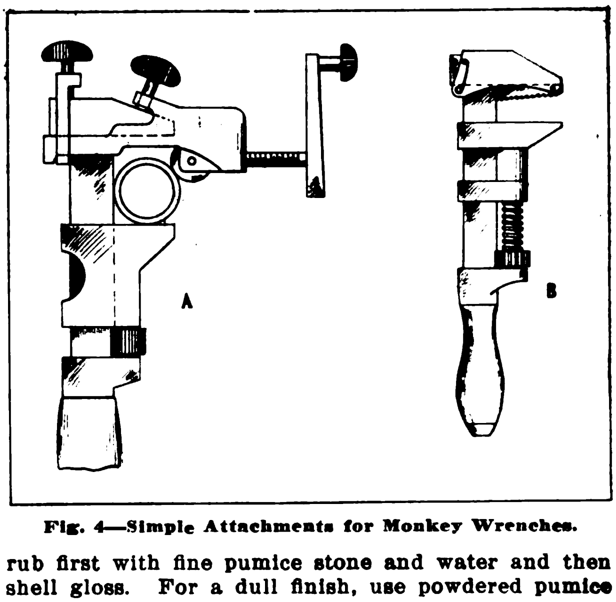


Fig. 4—Simple Attachments for Monkey Wrenches.

DRIVING THE LATHE BY MOTOR CAR.

An owner, who was mechanically inclined and did his own repairing, possessed a foot lathe which he utilized for light machine work. In preparing to overhaul his car he noted that considerable work of this nature would have to be done. Not wishing to go to the expense of taking this to a machine shop, he conceived the idea of using a small runabout as a means of supplying power, driving a flexible cable from the rear wheel of the automobile, as shown in the illustration herewith, Fig. 5. A is a flexible shaft about three feet long with ferrules brazed on either end. Each ferrule is drilled for the purpose of pinning couplings C and D which are made of .25-inch by one-inch soft steel with .4375-inch holes bored in each end. The coupling D is riveted to another coupling B, which is fastened to the felloe of the motor car wheel.

A hole .375 inch in diameter is drilled through the lathe shaft and coupling C, both being held together with a .375-inch bolt and nut. The coupling pins on the cable should be made of a suitable gauge brass wire, so in case the lathe becomes jammed the pins will shear off, preventing possible damage to the motor car wheel. The speed of the lathe is varied either by shifting the change speed gears of the automobile or by throttling, or both. The flexible shaft could be driven by a small gas engine and used for drilling, polishing, etc.

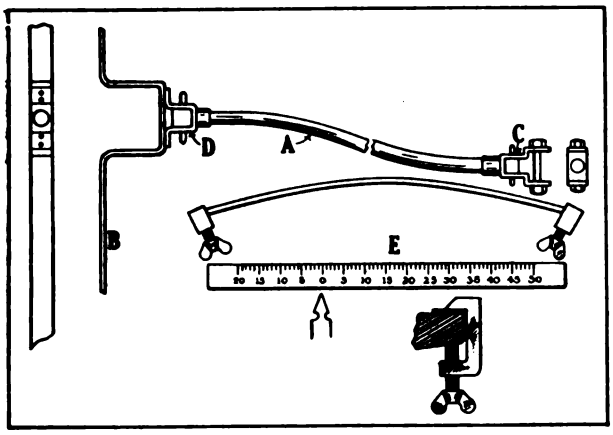


Fig. 5—Some Repair Kinks for the Owner Repairman: Upper Sketch, Method of Driving Foot Lathe by Motor Car Wheel; E, Valve Timing Gauge.

SPLASHGUARDS FOR AUTOMOBILE WHEELS.

The municipal authorities of a number of cities in Europe, notably in London and Paris, have taken under consideration the complaints of pedestrians, who use the thoroughfares where motor vehicles are numerous that mud baths are forced upon them every wet day by motor 'buses, trucks and pleasure cars which splash through the puddles of water collected near the curb or at the crossings. As a result of this, tests have been made of a steel or brass wire mesh guard designed to keep the mud from flying outward when a wheel drops into a pool of water.

One of the splashguards that has been successful in the trials is shown at Fig. 6. As will be obvious, it is suspended from the hub of the wheel, the bottom reaching to within a small fraction of an inch of the ground, thus forming a shield between the wheels and the sidewalks. The mesh is attached to a broad fan shaped piece of metal, provided with a journal at one end which is designed to turn with hub of the wheel, whereas the shield is kept from revolving by the tension spring attached to the end projecting a little above the hub and anchored to the mudguard.

In one of the tests a white screen was erected on a suburban road near London, in close proximity to a large puddle of water. A motor omnibus was equipped with the shields and driven through the pool at various speeds. Only a few small drops of mud were splashed upon the screen when the splashguard was fitted to the wheel, while a very pronounced effect in black and white was noted on the screen when the guards were removed. As will be evident, these are easily made, should not be costly and need only be used on stormy days.

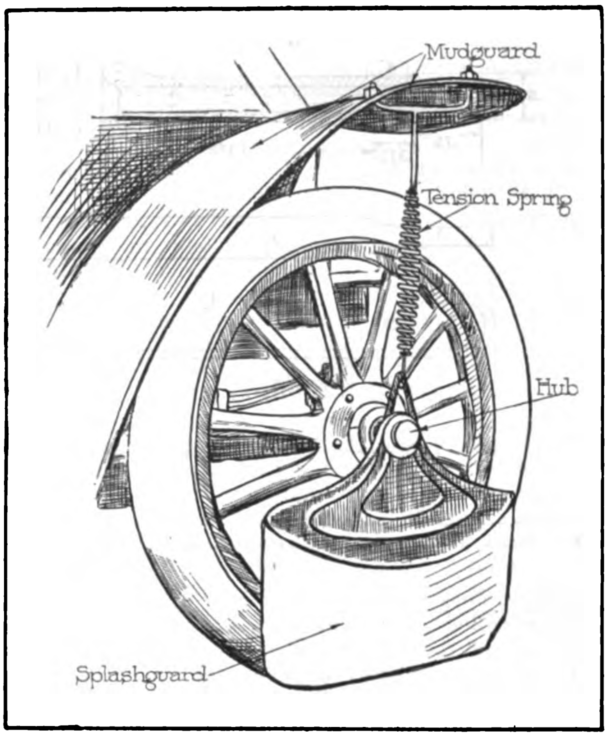


Fig. 6—Splashguard for Automobile Wheels.

ATTACHMENT FOR TWO-STROKE ENGINES.

One of the problems confronting designers of simple two-cycle engines, in which base compression is depended upon to transfer the gas to the cylinder of the motor is that of positive transfer at low engine speeds. This is particularly true when the throttle is partly closed and the quantities of gas inspired into the crankcase are not large enough to be properly compacted so that sufficient pressure is obtained to insure prompt gas flow from the base compartment to the combustion chamber.

At low speeds, one usually experiences some trouble in having a two-cycle cylinder fire regularly if the engine speed is regulated by the throttle in the carburetor. At the other hand it is not desirable to depend upon a retarded spark to slow the engine because of the excess heat developed and poor fuel

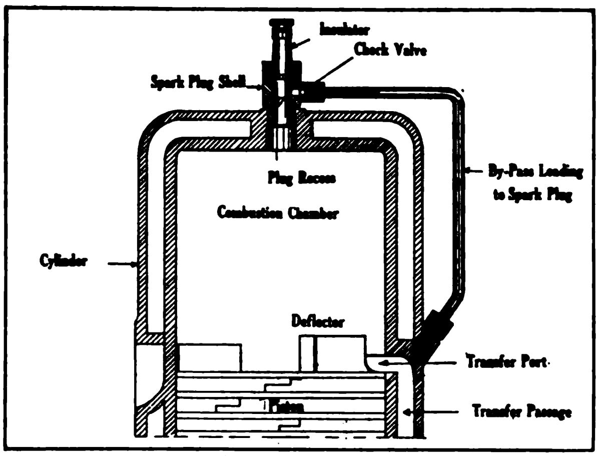


Fig. 7—Simple Gas Bypass for Two-Cycle Engines.

economy. One of the reasons for poor action is that the attenuated gas supplied the cylinder at small throttle openings and consequently low crankcase pressures does not ignite as readily as the richer mixture supplied at higher speeds and open throttle. Then again the burnt gas is not removed from the cylinder as completely as when the incoming charge has greater pressure. The result is that some of the residue will remain in the cylinder, and as this is lighter than the cold entering mixture, it is forced to the top of the combustion chamber.

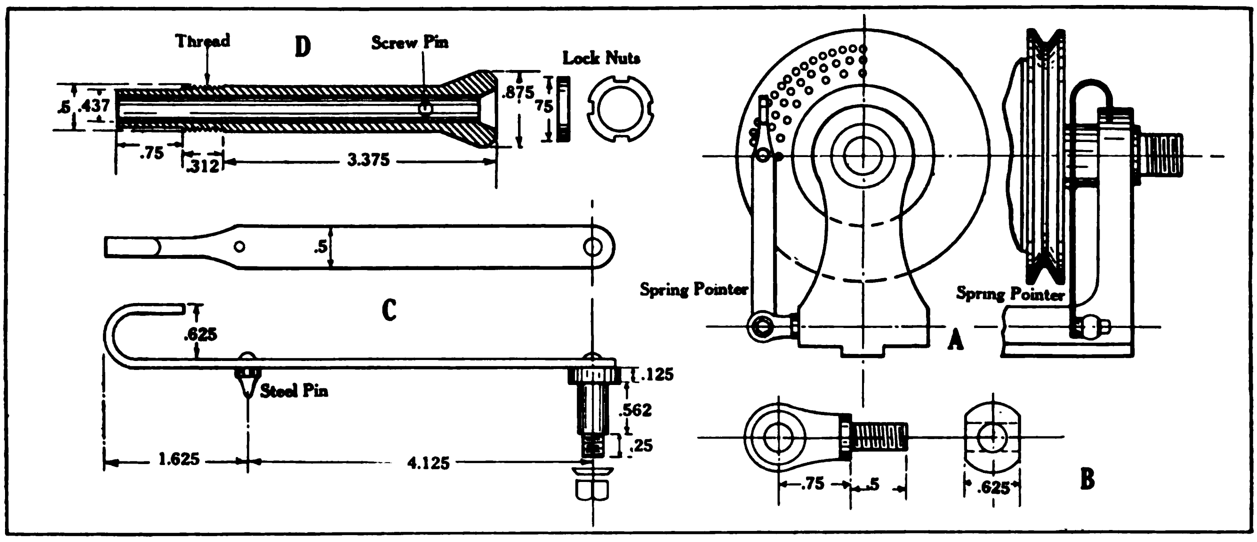


Fig. 8—A, Dividing Plate Attachment for Lathe; B, Pin Utilized for Attaching Spring; C, Construction of Spring Pointer; D, Drilling Spindle.

In an engine of the design shown at Fig. 7, a portion of this inert and non-combustible gas will collect in the pocket under the spark plug, and instead of the plug points being in fresh gas which will ignite readily, they are surrounded by good and bad mixture that will not kindle as quickly as the pure gas charge. When the spark takes place, it does not always fire the gas around the plug points and the engine misses fire. In fact, even at high engine speed, one may retain a certain portion of the burnt gas in the combustion chamber, with the result of weakening the explosions because of the slow combustion due to the impure gas immediately adjacent the plug points.

A simple method of insuring that the spark plug will be surrounded with fresh gas has been patented by Arthur H. Webber, Boston, Mass., and is shown at Fig. 7. It consists of providing a small bypass pipe from the transfer port to the spark plug shell. This is a special type having a deep pocket which provides considerable space around the spark plug insulator. A portion of the compressed charge in the crankcase is supplied this chamber through the ball check valve in the spark plug bushing, and when the spark takes place, the fresh mixture surrounding the electrodes is immediately ignited, this in turn firing the gas contained in the combustion chamber of the engine. As a portion of the fresh charge is transferred to the plug even at low engine speeds, the spark always occurs in explosive mixture. This should make for steadier running at both low and high engine speeds, as well as cleanliness, and keep down the temperature of the spark plug insulator, thus minimizing trouble due to sooty accumulations or cracking of the porcelain because of the excessive heat.

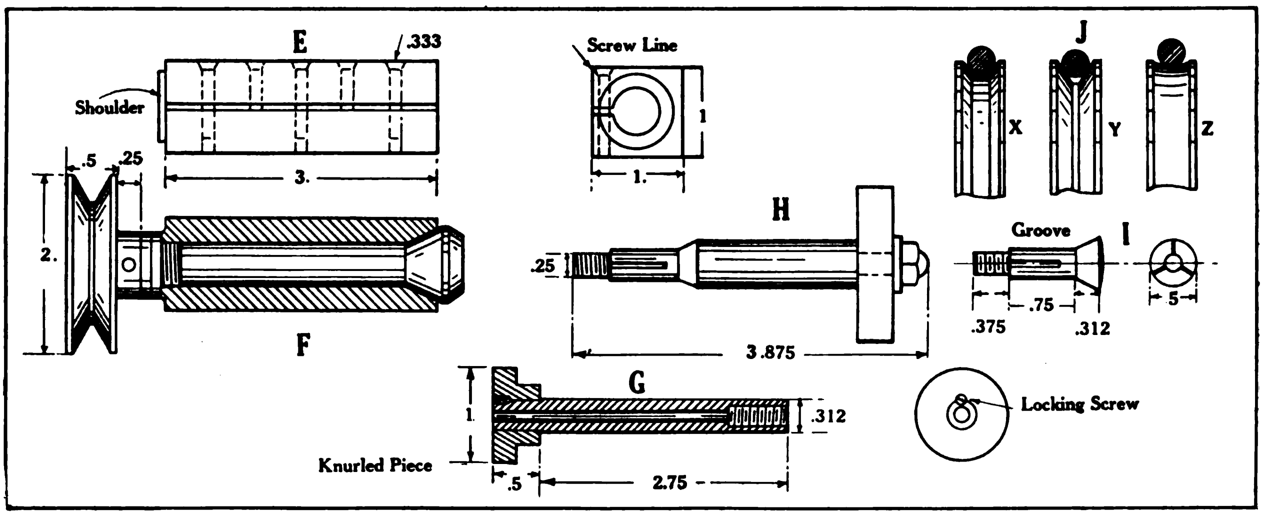


Fig. 9—E, Holder for Drilling Spindle; F, Section of Drilling Device; G, Draw Spindle; H, Chuck for Small Emery Wheel; I, Spring Chuck; J, Types of Pulley Grooves.

ACCESSORIES FOR THE LATHE.

Numerous fittings may be applied to the lathe to facilitate the work of the repairman, some of which are indicated in the sketches, Figs. 8 and 9. Where this device is utilized for milling, wheel cutting and tap fluting, it is essential that a dividing plate be attached to the pulley, and at A is presented an attachment of this nature.

Sometimes the face of a pulley on the spindle is wide enough for two, three or four rows of holes as shown in the illustration. Four circles, containing respectively 60, 80, 84 and 96 divisions, will give a wide range for wheel cutting, etc. If it be impractical to drill the face of the pulley, a brass plate can be attached, it previously having been divided as suggested above.

At A also is shown the spring pointer device and its method of attachment. It is made from a piece of flat steel, .0625 inch thick and .5 inch wide to the dimensions depicted at C. The steel pin is riveted into the plate. Its point should be hardened, and of such size as to fit into the holes drilled in the dividing plate shown at A. The top of the spring is bent to form a handle. At its other end is riveted another pin which fits into a drilled hole shown at B, and the member is held by a small nut and washer. This, when finished, is screwed into its correct position and into a .3125-inch tapped hole in the headstock casting, and the spring, seen at C, so adjusted that it firmly holds the lathe spindle in any desired position.

When not in use it may be moved out of the way without disturbing the connecting nut at the bottom. Before drilling the piece shown at B, it should be screwed into the casting right up to the shoulder and the position for the hole marked. It is then unscrewed, drilled through, and faced up on both sides, by pushing it tightly on a turned pin held in the chuck. If so desired, the index pointer can be attached to the opposite side of the headstock.

Drilling Spindle.

A small drilling spindle that may be utilized in connection with the dividing plate, and may be used in an endless variety of work in drilling, fluting, keyway cutting, square, hexagon or octagon milling, in steel, brass, etc., may be constructed as indicated at D. The body of this device is made from a three-inch length of mild steel, one inch square. This is drilled through and then finished with a reamer to .5-inch diameter. The bore should be quite smooth and parallel with that part of the holder which rests on the cross slide when in use.

A pin, or spigot, is held in the chuck and turned until it fits nicely into the hole in the holder, which is shown at E. The ends are next faced up on the pin, and trued with the bore, leaving a small shoulder as indicated in the illustration. The other end is coned out accurately to an angle of 40 degrees; that is, the top slide is set over that amount. It is then sawed through one side, and the burr carefully removed from the inside. The three .125-inch screws, shown at E, are tapped into the lower half of the holder. The three shorter ones fit into the upper half, as illustrated. The three former when tightened, tend to draw the parts together, while the three latter are utilized for expanding the holder.

When finished, the holder should be case hardened all over. It may be slightly out of true after the process and require lapping. The spindle for this member is shown at D. It is turned from a piece of .875-inch mild steel, and to the dimensions given. First, drill through its centre with a .28125-inch drill, then finish the bore with a D-bit made from a length of .3125-inch silver-steel. At the small end shown at D it is turned parallel to take the pulley presented at F, which, when finished, is attached to the spindle with three .15625-inch grub screws, the points fitting into slightly countersunk holes therein.

A 26-thread is then cut at the small end to which reference has been made previously, to take two lock nuts. A .109375-inch hole is drilled and tapped for an .125-inch grub screw, which is screwed in just below the outer diameter of the spindle. It is filed as noted in the illustration, and projects through on the inside about .046875 inch. The finished diameter of the spindle is about .5 inch. This, however, should be left about .005 inch larger, then case hardened, and afterwards ground to a nice running fit in the holder. At F is shown the device assembled. The .125-inch long screws at E, are utilized for adjustment.

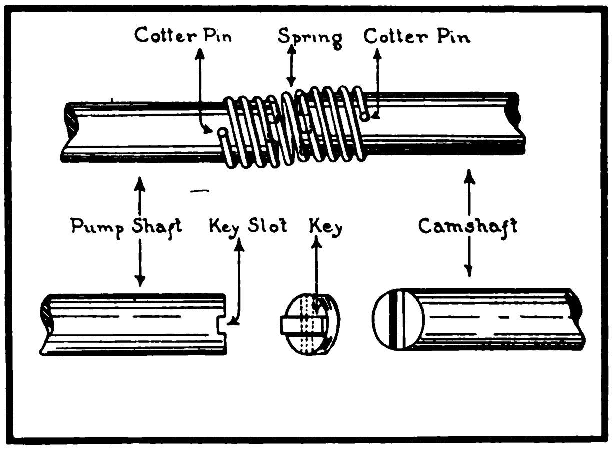
Draw Spindle.

A draw spindle, presented at G, can be made from stout .3125-inch steel tubing. It is tapped at one end to take the spring chuck shown at I, this being standard, having a groove that fits over the screw pin at D, which is filed to correspond. The other end of the spindle is shouldered down to take the knurled piece shown at G, which is forced on. A .125-inch screw is utilized to prevent its turning when being tightened.

A chuck for the purpose of holding a small emery wheel is shown at H. This device will be found useful for a variety of purposes such as tap, reamer and cutter grinding, or for use on external work. J illustrates three examples of grooves in small pulleys. When turning these, if grooved as shown at X, the gut, or whatever material is used, is only gripping at one point, and would have to be drawn tight to enable it to drive a cutter or similar tool. Z is also faulty in this respect, while Y shows the correct method, the maximum of power being obtained with a minimum of friction.

PUMP COUPLING DEVICES.

Where a key is utilized to form a connection between the driving shaft and pump in the water circulation system, the design is such that the space occupied by it is very small. If the slots into which this fits become worn, the stock part cannot be used and it is necessary to make a new one. Similarly, if the shafts be not aligned, the coupling will be bent and twisted out of shape by the eccentric motion imparted.



Some Pump Key Hints: A, Practical Device Where Keyways Are Out of Line; B, Spring Coupling.

The writer recalls an instance where an owner was obliged to make frequent replacements of this nature and sometimes these occurred while on the road. At last the keyways became so worn that a special key had to be made, which failed to last for any length of time. Upon close examination it was found that the trouble was due to the shafts not being in a line. The construction of the pump was such that it would not permit of filing the bolt holes without weakening the member and to overcome the stresses of misalignment a coupling, like that shown in accompanying sketch, was suggested.

The key slots were first filed true and measured. A piece of round steel, small enough to slide easily between the shafts, was centred on one side, measured and cut with a hacksaw. This was then filed to make a loose fit with one slot, while the other side was treated in like manner. The pump was replaced and no further trouble was experienced although the car was run several thousand miles.

Another method is also shown and this can be employed where the shafts are considerably out of alignment. It consists of a stiff spring the ends of which are fastened to the shafts by large cotter pins. Holes are drilled to take these, the ends of the spring being hooked into the heads of the holders. The former should be closely wound and so attached that when the shaft revolves it winds up the coil.

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Trade organizations directly identified with the motor vehicle and allied industries are not to be condemned because of absence of enthusiasm and energy, which appears to be a condition frequently realized, but should be critcised because of actual losses resulting from apathy and failure to act when action would accomplish a great deal.

Probably no class of business men suffers through obnoxious legislation as does the automobile trade. Year after year unreasonable measures are continued in effect or drastic amendment to existing laws is made simply from the unwillingness or refusal of the business men to act as will protect their own interests and relieve the motoring element.

There is no reason why the automobile trade and social organizations cannot unite and present demands with such sound argument, and with such weight of personal influence, that the desired amendments to the statutes will be no longer denied.

PROMOTION OF BUSINESS.

Whatever will promote the use of pleasure automobiles is directly stimulative of business. By this is meant that communities that can attract motorists invariably receive ample return from visitors, and conditions that will make for safe traffic must always be commended. With a very large proportion of the motorists the evenings are given over to driving and for the safeguarding of all proper precaution should be exacted from people and from users of vehicles alike.

Probably no greater influence for good can be specified than carrying lights on all forms of road conveyance. This is required by the Massachusetts and Connecticut laws, but in the majority of states only motor cars must be lighted. With traffic constantly increasing the dangers will multiply and common sense would dictate that there be not only lighting of every type of highway transport but codes of signals that will indicate conditions that may be obscured even with the best of illuminating equipment. No good reason can be offered for rejection of the proposal, and every argument made must be favorable to it.

WHAT IS A COMPLETE STOCK?

One of the greatest factors in business success is buying well. This does not necessarily mean large purchases, but in renewals of stock that can be sold with and without reference to seasons. One of the best business men in the automobile accessory trade advises that the comparatively small dealer carry a stock in which his capital will not be tied up in lines that can only be sold during climatic extremes, or which may be only in occasional demand, no matter what the inducement offered by the salesman, but be willing to take a smaller margin of profit, replenishing as occasion requires. With other classes of goods it is wise to consider the needs of the motorists and purchase what will sell readily. A complete stock is in a sense made up of staple goods, and what cannot be sold without special effort is not desirable at any price. In other words, there should be care taken to stock only what is demanded and what has been well advertised.

THE VALUE OF CREDIT.

The greatest asset of any business man is his credit. It may be that credit will not be sought but that it is not is one of the strongest recommendations for a firm or corporation. Taken as a whole there is not as great confidence in many automobile and allied trade propositions as there should be, and this condition reflects upon all as well as directly affecting those who, often requiring accommodation, find conditions imposed that necessarily limit their business activities. Often the cause is neglect of business details and losses through confidence that has been abused, but be that as it may the only one who really suffers is he who is, after all, responsible for his own affairs. It may be pointed out that he who is careful of his credit usually has all he needs.

APPLICATION OF METHOD.

Whatever the ideal, whatever the purpose, whatever the system, there can be no result obtained unless endeavor is made to apply methods. In this sense it is apparent that business success is entirely dependent upon the controlling mind, and that nothing can be accomplished without effort. It is as imperative to make application of method in business as it is to employ capital.

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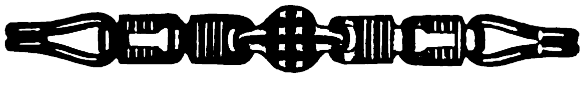

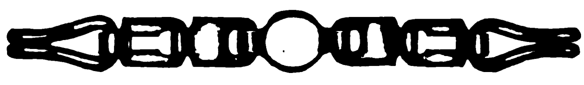

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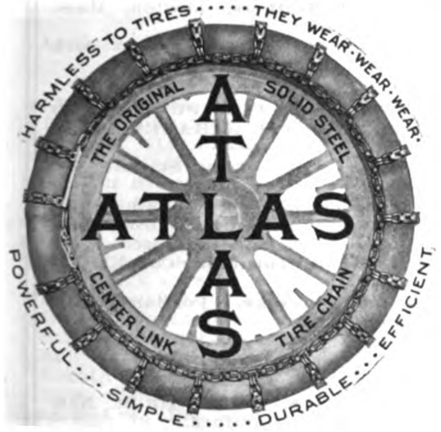
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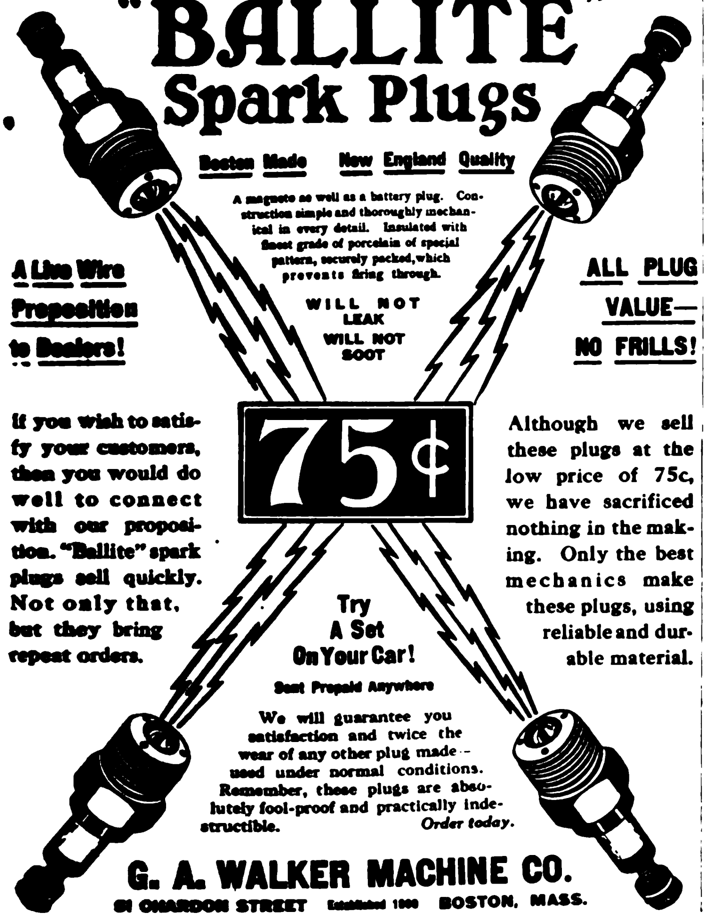

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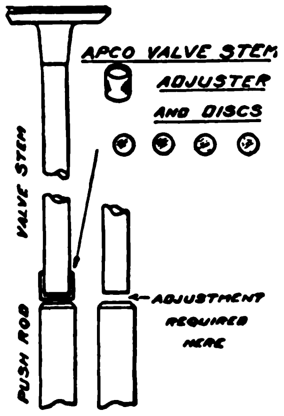

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Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tire Casings and Inner Tubes.

Consolidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-Springfield.)
Branches: See Tire Casings and Inner Tubes.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Rims—Removable and Detachable.

Michelin Tire Co., Milltown, N. J.
Branches:. See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

United States Tire Co., Broadway and 58th St., New York City.
Branches: See Rims—Removable and Detachable.

TIRE SLEEVES.

Selbach Rubber Co., 404 Atlantic Ave., Boston, Mass. (Selbach Safety.)

TIRE TOOLS AND REMOVING EQUIPMENT.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York City.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Lansing Co., 70 Walnut St., Lansing, Mich.
Branches: Factory, Parkin, Ark.; Chicago, New York, Kansas City, Philadelphia, San Francisco.

Pitless Auto Turntable Co., Kansas City, Mo.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

VALVE STEM ADJUSTORS.

Auto Parts Co., Motor Ave., Providence, R. I. (Apco.)

VARNISHES FOR AUTOMOBILE BODIES.

U-Auto-Varnish Co., Cleveland, O.
Branch: 218 Columbus Ave., Boston, Mass.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WELDING AND WELDING PROCESSES.

Welding Co., The, 51 Bay St., Springfield, Mass.
Branches: 63 Southampton St., Boston, Mass.; 46 Elm St., Hartford, Conn.

WINDSHIELDS AND WINDSHIELD CLEANERS.

Conover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

Gabriel Horn Mfg. Co., 1421 E. 40th St., Cleveland, O. (Cleaner.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

Coes Wrench Co., Worcester, Mass.

Cutter, Geo. A., Taunton, Mass.

Walworth Mfg. Co., Boston, Mass. (Stillson.)

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading.

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, Mass.
Branch: 113 Massachusetts Ave., Boston, Mass.
Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York City.
Lucas & Co., Brookline, Mass.
Miller, Chas. E., 97-103 Reade St., New York City.
Branches: 202-204 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York City; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia, Penn.; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.
Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.
Waite Auto Supply Co., 81 Exchange place, Providence, R. I.

ACETYLENE TANKS.

Prest-O-Lite Company, 271 East South St., Indianapolis, Ind. (Prest-O-Lite.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, East Cambridge, Jacksonville, Kansas City, Long Island City, Los Angeles, Milwaukee, Minneapolis, New York, Oakland, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

AUTOMOBILE PUBLICATIONS.

The Automobile Journal, 24 issues, $1.00 the year.
The Motor Truck (Commercial Car), monthly, $1.00 the year.
The Accessory and Garage Journal, Monthly, $1.00 the year.
The A B C of Motor Car Operation .... .50
The A B C of Aerial Navigation. .50
The A B C of Internal Combustion Engine, Maintenance and Repair .... .35
The A B C of Carburetor Construction, Maintenance and Repair .... .35
The A B C of Magneto Systems .35
The A B C of Battery Ignition Systems .... .30
The A B C of Motor Car Chassis, Maintenance and Repair...... .25
Maintenance and Repair of Motor Car Tires.......... .25
Lighting the Motor Car by Electricity .... .25
Overhauling, Rebuilding and Equipping the Motor Car..... .50

Sent Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

BALLS AND BALL BEARINGS.

Bretz Co., J. S., 250 W. 54th St., New York City (F & S.)
New Departure Mfg. Co., Bristol, Conn.

BATTERIES — ELECTRIC STORAGE.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

BATTERIES— VEHICLE AND IGNITION.

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York City.
Niagara Lead & Battery Co., Niagara Falls, N. Y. (Salom.)
Waite Auto Supply Co., 81 Exchange place, Providence, R. I. (Success.)

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)
Standard Woven Fabric Co., 7 Summer St., Worcester, Mass. (Multibestos.)

BRAKES FOR PLEASURE AND COMMERCIAL CARS.

Royal Equipment Co., The 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARS—GASOLINE PLEASURE.

Abbott Motor Co., 605 Waterloo St., Detroit, Mich. (Abbott-Detroit.)
American Motors Co., Indianapolis, Ind. (American.)
Atlas Motor Car Co., 104 Birnie Ave. Springfield, Mass. (Atlas.)
Branch: N. E. corner Broadway and 64th St., New York City.
Berkshire Auto Car Co., Pittsfield, Mass. (Berkshire.)
Brush Runabout Co., 61st St. and Broadway, New York City. (Brush runabout, Liberty-Brush.)
Buckeye Mfg. Co., Anderson, Ind. (Lambert.)
Cameron Car Company, Beverly, Mass. (Cameron.)
Cartercar Co., Pontiac, Mich. (Cartercar.)
Cole Motor Car Co. See Henderson Motor Sales Co.
Columbia Motor Car Co., 61st St. and Broadway, New York City. (Columbia.)
Corbin Motor Vehicle Corp., New Britain, Conn. (Corbin.)
Dayton Motor Car Co., 61st St. and Broadway, New York City. (Stoddard-Dayton.)
E-M-F Co., Detroit, Mich. (E-M-F, Flanders.)
Great Western Automobile Co., Peru, Ind. (Great Western.)
Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)
Henderson Motor Sales Co., Indianapolis, Ind. (Cole.)
Eastern Distributors: Colt-Stratton Co., Broadway at 68th St., New York City.
Herreshoff Motor Co., 620 Harper Ave., Detroit, Mich. (Herreshoff.)
Hupp Corporation, 107 Lycaste St., Detroit, Mich. (R. C. H.)
Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.
Ideal Motor Car Co., Indianapolis, Ind. (Stutz.)
Imperial Automobile Co., Jackson, Mich. (Imperial.)
Inter-State Automobile Co., Dept. N, Muncie, Ind. (Inter-State.)
Branch: 153 Massachusetts Ave., Boston, Mass.
Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)
Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)
Knox Automobile Co., Springfield, Mass. (Knox.)
K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)
Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.)
Lexington Motor Car Co., Connersville, Ind. (Lexington.)
Marquette Co., The, Detroit, Mich. (Marquette.)
Branches: New York City, Chicago, Boston.
Maxwell-Briscoe Motor Co., 61st St. and Broadway, New York City. (Maxwell.)
Metz Company, Waltham, Mass. (Metz.)
National Motor Vehicle Co., 1033 22nd St., Indianapolis, Ind. (National.)

BUYERS' GUIDE---Continued

Oakland Motor Car Co., 1300 Oakland Ave., Pontiac, Mich. (Oakland.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Renault Freres Selling Branch, Broadway and 57th St., New York City (Renault.)
Branches: 1606 Michigan Ave., Chicago, Ill.; 116-120 Van Ness Ave., San Francisco, Cal.; Motor Mart, Boston, Mass.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City. (Sampson 30.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 **Essex** Ave., Dayton, O. (Speedwell.)

United States Motor Co., Broadway and 61st St., New York City (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland, O. (White.)
Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC PLEASURE.

Waverley Co., The, 172 South East St., Indianapolis, Ind. (Waverley.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Brush Runabout Co., 61st St. and Broadway, New York City. (Brush.)

Cameron Car Co., Beverly, Mass. (Cameron.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Decatur Motor Car Co., Decatur, Ind. (Decatur.)
Branch: Eastern, 20 Green St., Boston, Mass.

General Motors Truck Co., Detroit, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Moeller, H. L. & Co., New Haven, Conn. (Moeller.)
Branch: 1123 Broadway, New York City.

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Renault Freres Selling Branch, Broadway and 57th St., New York City (Renault.)
Branches: See Cars — Gasoline Pleasure.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City (Sampson.)

Standard Motor Truck Co. of N. E., 9-11 Harcourt St., Boston, Mass. (McIntyre.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., Broadway and 61st St., New York City (Sampson, Brush, Stoddard.)

Universal Motor Truck Co., 510 Theodore St., Detroit, Mich. (Universal.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

Waverley Co., The, 172 South East St., Indianapolis, Ind. (Waverley.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 2754 Rhode Island Ave., Detroit, Mich. (Sampson.)

United States Motor Co., Broadway and 61st St., New York City (Sampson.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

White Co., The, 828 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CHAINS, TIRE.

Atlas Chain Co., 34 35th St., Brooklyn, N. Y. (Atlas.)

McLain & Co., H. E., 165 Pond St., Natick, Mass.

CHAINS — TRANSMISSION OR DRIVING.

Hoffnung & Co., S., Ltd., 118 Broad St., New York City (Coventry.)

Miller, Chas. E., 97-103 Reade St., New York City (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES — AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CONNECTORS AND TERMINALS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tank for address of main office and branches.

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

HEATERS, BRICKETTES, ETC.

Chicago Flexible Shaft Co., 132 La Salle Ave., Chicago, Ill. (Duchess and 7X Heaters; Clark Carbon brickettes.)

HORNS—BULB, ELECTRIC, EXHAUST.

Automobile Supply Mfg. Co., 220 Taafe Place, near DeKalb Ave., Brooklyn, N. Y. (Newtone.)

Gabriel Horn Mfg. Co., 1421 E. 40th St., Cleveland, O. (Gabriel.)

Randall-Faichney Co., Boston, Mass. (Jericho.)

Sterling Machine Co., The, Norwich, Conn. (Uncas Siren.)

JACKS AND LIFTING DEVICES.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.
Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

LIGHTING EQUIPMENT — ELECTRIC.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

Esterline Company, The, La Fayette, Ind. (Matchless.)
Branches: Detroit, Mich.; San Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 810½ Chapel St., New Haven, Conn.

BUYERS' GUIDE---Continued

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York City.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 44 Power Ave., Cleveland, O.

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Bretz Co., J. S., 250 W. 54th St., New York City (U. & H.)

Connecticut Telephone & Electric Co., 10 Britannia St., Meriden, Conn.
Branches: 819-A Boylston St., Boston, Mass.; 1783 Broadway, New York City; 1146 Michigan Ave., Chicago, Ill.; 544 Van Ness Ave., San Francisco, Cal.; 1518 Broadway, Denver, Col.; 510-511 Majestic Bldg., Detroit, Mich.; 12 So. Eighth St., Minneapolis, Minn.

Heinze Electric Co., Lowell, Mass. (Heinze.)

Herz & Co., 295 Lafayette St., New York City (Herz.)

K-W Ignition Co., The, 44 Power Ave., Cleveland, O.

Marburg Bros., 1777 Broadway, New York City (Mea.)

Simms Magneto Co., 1780 Broadway, New York City.
Branches: London and Paris.

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: 1679 Broadway, New York City; 1110 South Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-436 Van Ness Ave., San Francisco, Cal.; 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MOTORCYCLES AND MOTORCYCLE SUPPLIES.

American F. N. Co., Boston (F. N.)
Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Hendee Mfg. Co., Springfield, Mass. (Indian.)
Branches: 1251 Michigan Blvd., Chicago, Ill.; 234 Van Ness Ave., San Francisco, Cal.; 178 Gt. Portland St., London, Eng.

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

International Automobile Association, Shelden M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 122 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

OILS, GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)
Branches: Boston, Mass.; Fall River, Mass.; Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)
Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.)
Branch: 66 Wabash Ave., Chicago.

Havoline Oil Co., 133 William St., New York City (Havoline.)

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)
Branch: 284 Columbus Ave., Boston, Mass.

Kincaid Oil Co., 219-221 West Exchange St., Providence, R. I. (Kincaid.)

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York City (Monogram.)
Branches: 126 Massachusetts Ave., Boston, Mass.; 423 Passaic Ave., East Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)
Branches: In all cities.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., 80 Broad St., New York City (Wolverine.)
Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.; 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE GUNS.

Randall-Faichney Co., Boston, Mass. (B-Line.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

PUMPS—HAND AND ENGINE OPERATED.

Bridgeport Brass Co., 124 Crescent St., Bridgeport, Conn. (Atlas.)

RIMS — REMOVABLE AND DETACHABLE.

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

Jordan Demountable Rim Co., 733 Boylston St., Boston, Mass.

Michelin Tire Co., Milltown, N. J.
Branches: Boston, Mass.; Buffalo, N. Y.; New York City; Philadelphia, Penn.; Cleveland, O.; Chicago, Ill.; Detroit, Mich.; Denver, Col.; San Francisco, Cal.; Seattle, Wash.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Connecticut Shock Absorber Co., 10 Britannia St., Meriden, Conn.
Branches: See Magnetos and Magneto Supplies.

Gabriel Horn Mfg. Co., 1421 E. 40th St., Cleveland, O. (Foster.)

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Westen Mfg. Co., 289 Halsey St., Newark, N. J.

SOAPS.

Hopewell Brothes, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York City.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Herz & Co., 295 Lafayette St., New York City (Bougie Mercedes.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Lucas & Co., Brookline, Mass. (Sta-Rite.)

Mac-Kae Manufacturing Co., Boston, Mass. (MacKae.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Walker Machine Co., G. A., 51 Chardon St., Boston, Mass. (Ballite.)

Walker Machine Co., G. A., 83 Braintree St., Allston Station, Boston, Mass. (Ballite.)

SPARK PLUG TERMINALS.

Mac-Kae Mfg. Co., Boston, Mass. (MacKae Universal.)

SPEEDOMETERS AND RECORDING DEVICES.

Casgrain Speedometer Co., 172 Columbus Ave., Boston, Mass.
Branches: 1919 Broadway, New York City; 2031 Euclid Ave., Cleveland, O.

Jones Speedometer, New Rochelle, N. Y.
Branches: 1340 Michigan Ave., Chicago, Ill.; 109 Massachusetts Ave., Boston, Mass.; 1409 Vine St., Philadelphia, Penn.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)
Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.; 1212 South Main St., Los Angeles,

BUYERS' GUIDE---Concluded

Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Indianapolis, Kansas City, Los Angeles, New York City, Philadelphia, Pittsburg, Portland, Ore.; San Francisco, Seattle, St. Louis; 559 Yonge St., Toronto, Ont.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Igniter Co., 44 Power Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Batcheller Rubber Mfg. Co., 182 Hudson St., New York City.

Consolidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-Springfield.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Detroit, Mich.; Cincinnati, O.; San Francisco, Cal.; Los Angeles, Cal.; Akron, O.

Empire Tire Co., Trenton, N. J.
Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia, Penn.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Michelin Tire Co., Milltown, N. J.
Branches: See Rims—Removable and Detachable.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRE CHAIN GRIPS.

Atlas Chain Co., 34 35th St., Brooklyn, N. Y. (Atlas.)

TIRE INFLATING TANK.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tank for address of main office and list of branches.

TIRE LOCKS.

B-A Auto Specialty Co., 496 Third Ave., New York City (B-A.)

Lucas & Co., Brookline, Mass. (B-A Auto.)

TIRE PRESERVATIVES AND PROTECTORS.

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. (Slikup.)

Michelin Tire Co., Milltown, N. J. (Mastic.)
Branches: See Rims, Removable and Detachable.

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Chicago, Detroit, Kansas City.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tire Casings and Inner Tubes.

Consolidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-Springfield.)
Branches: See Tire Casings and Inner Tubes.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Michelin Tire Co., Milltown, N. J.
Branches: See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

United States Tire Co., Broadway and 58th St., New York City.
Branches: See Rims—Removable and Detachable.

TIRE SLEEVES.

Selbach Rubber Co., 404 Atlantic Ave., Boston, Mass. (Selbach Safety.)

TIRE TOOLS AND REMOVING EQUIPMENT.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York City.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Lansing Co., formerly Lansing Wheelbarow Co., Lansing, Mich.
Branches: Factory, Parkin, Ark.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Pitless Auto Turntable Co., Kansas City, Mo.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, Hartford, Conn. (Kant-Break.)

VALVE STEM ADJUSTORS.

Auto Parts Co., Motor Ave., Providence, R. I. (Apco.)

VARNISHES FOR AUTOMOBILE BODIES.

U-Auto-Varnish Co., Cleveland, O.
Branch: 218 Columbus Ave., Boston, Mass.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WELDING AND WELDING PROCESSES.

Welding Co., The, 51 Bay St., Springfield, Mass.
Branches: 63 Southampton St., Boston, Mass.; 46 Elm St., Hartford, Conn.

WINDSHIELDS AND WINDSHIELD CLEANERS.

Conover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

Gabriel Horn Mfg. Co., 1421 E. 40th St., Cleveland, O. (Cleaner.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

Coes Wrench Co., Worcester, Mass.

Cutter, Geo. A., Taunton, Mass.

Walworth Mfg. Co., Boston, Mass. (Stillson.)

THE ACCESSORY -AND- GARAGE JOURNAL
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COMING MOTOR VEHICLE DISPLAYS

Attracting Attention of Every Active Enterprise in the Industry—Garden, Palace, Salon and Chicago Shows All More Pretentious Than Ever Before—Record Attendance and Business Assured.

THE proximity of the exhibitions of motor vehicles regarded as national has attracted the attention of every active enterprise in the industry. The first is to be held at New York, that at Madison Square Garden beginning January 6 and continuing until January 20, to be followed by the second at the Grand Central Palace, from January 10 to 17 inclusive. The displays have greater attraction than ever before because of the fact that they are not competitive and the one in a sense is as representative as the other.

The Madison Square Garden show is conducted in behalf of the Automobile Board of Trade by the show committee of that organization, which consists of Alfred Reeves, sales manager of the United States Motor Company; Col. George Pope, treasurer of the Pope Manufacturing Company, and Merle L. Downs, the latter serving as secretary and executive of the show committee. These men are in every way experienced in the conduct of automobile shows and with their knowledge and capacity there is every reason to believe that the exhibition will be the most complete and interesting that has ever been held at the Madison Square Garden.

Following the custom inaugurated a year ago the first week of the show will be devoted to pleasure vehicles and the second to industrial or service conveyances, and in connection with these displays will be an unusually complete showing of accessories. The pleasure vehicle show will include 60 different makes of cars, and among them will be the oldest and best known machines built in this country. There will be 56 gasoline cars and four electrics shown, of which but two are new makes, the Flanders electric and the S. G. V., made by the S. G. V Company at Reading, Penn.

The power wagon division of the show will include 32 different exhibits, of which six will be electric vehicles. Of these the product of the Bronx Electric Vehicle Company, the General Motors Company and the Ward Motor Vehicle Company will be shown for the first time. The machines will range from the light delivery wagon to the heavy six and a half ton truck, while all manner of body equipment will be displayed.

The motorcycle display will be made during the week the pleasure cars will be shown and in this classification will be seen 16 different makes of machines. The number is larger than ever before and it is expected that this section will be unusually attractive and interesting. The exhibits will include all of the well known makes, and for the first time several of the Western machines will be shown at the Garden. These will include the Minneapolis, the Henderson, and the Flanders, while the Pope will also make its first appearance at a show. The Minneapolis is well known in the West, but the Henderson and the Flanders are both new. The Henderson is a four-cylinder mount with a number of features that are decidedly interesting. The Flanders and the Pope are both single-cylinder machines.

The accessory departments will be noteworthy from the fact that there is a tendency on the part of the exhibitors to show what may be useful or serviceable for equipment or supplies, while the number of part makers exhibiting is seemingly decreasing each year. There will be a total of 317 displays in this division and in addition to this eight publications will be represented.

Taken all in all the show will have no less than 436 separate and distinct exhibitors, which can be summarized as follows:

Pleasure cars	60
Power wagons	32
Motorcycles	16
Publications	11
Accessories	317
	436

The Madison Square Garden show will be opened the evening of January 6 at 7 o'clock. The pleasure car division will be concluded the evening of January 13. The power wagon part is expected to be opened at 11 o'clock the morning of January 15 and will continue until 11 the evening of January 20.

The Grand Central Palace show will be opened the evening of January 10 at 7 o'clock. This display will be under the auspices of the National Association of Automobile Manufacturers and the management of Samuel A. Miles. Mr. Miles has for a decade conducted the exhibitions of this organization at Chicago and he is regarded as one of the most experienced and capable executives in the country. The show will be the first to be held in the Grand Central Palace and there is an area of about 120,000 square feet which will insure abundant space for the exhibits and the visitors. With the organization controlled by Mr. Miles, the fine, new exhibition building, and the large number of exhibitors this show is certain to be attractive from every viewpoint.

At this show both pleasure cars and power wagons will be shown, there being 33 different makes of the former classification and 35 of the second. A considerable number of both types of machines will be seen at New York for the first time. Much interest is attached to some, they being highly developed and perfected vehicles, and the creations of men of well known reputation as engineers. These cars and wagons will undoubtedly attract many to this show, and the combination of the two, being shown at the same time as the Madison Square Garden exhibition, ought to be given an attention by all interested in automobiles who will visit the metropolis. The latest list of accessory exhibitors totals 46, to which should be added eight publications. The summary of the show follows:

Pleasure cars	33
Power wagons	35
Accessories	46
Publications	8
	122

The two shows combined will have 558 exhibitors.

The Importers' Automobile Salon will this season be at the grand ball room of the Hotel Astor, and will be opened January 2. At this there will be 17 different makes of machines shown. These will include the Napier and Daimler cars from England; Itala, Isotta, Lancia and S. P. A. cars from Italy; the Metallurgique and Minerva cars from Belgium; Benz, Mercedes and Opel cars from Germany; Renault, Panhard, De Dion-Bouton, Darracq and C. G. V. cars from France, and the Pic-Pic car from Switzerland. One of the features of the exhibition will be the showing of specially designed bodies.

The show at Chicago will be under the auspices of the National Association of Automobile Manufacturers and the management of Samuel A. Miles. It will be in the Coliseum and the First Regiment Armory and, as the Madison Square Garden show, will be for two weeks. The first week, beginning January 27, will be devoted to pleasure vehicles, and the second, beginning February 5, to power wagons. Both buildings will be utilized both weeks. This will be the largest of the series of shows in that it will have 96 different makes of pleasure machines, while there will be seen 187 exhibits of accessories. This will include seven publications. The second week there will be shown 71 different makes of power wagons and 17 makes of motorcycles, 111 different exhibits of accessories and parts, and 11 publications. The total showing of pleasure cars, power wagons and motorcycles for Chicago will be 184, while at New York the total for both shows will be 176.

It is expected that the shows will be largely patronized and that the results will be more gratifying than ever before, especially from the power wagon exhibitions.

KNIGHT ENGINES FOR ATLAS CARS.

The Atlas Motor Car Company, Springfield, Mass., has adopted a Knight sleeve-valve silent engine for a new type of touring car that it is to place in the market. The engine will be the product of the Atlas Engine Company, Indianapolis, Ind., which has license to build under the Knight patents. The Atlas company will continue to build and use the Atlas two-cycle motor it has used for several years.

Ernest Coler, for a long period in charge of the publicity of the Maxwell-Briscoe Motor Company, and later supervisor of similar work for the United States Motor Company, will conclude his services in that capacity to undertake similar duties with the Willys-Overland Company at Toledo, O.

DEMAND FOR ENGINE-STARTING DEVICES.

Attention Directed Toward Development and Perfection of Practical and Economical Appliances.

The demand for an engine-starting device as standard pleasure car equipment has directed the attention of inventors very generally toward the development and perfection of installations that will be practical and economical. The number of concerns that have self-starters ready for or already in the market is surprisingly large, there being no less than 50 that are regarded as marketable. How many others there may be is uncertain, but this is a sufficient indication that for the coming year there will be at least a sufficient supply to meet all reasonable demands.

The types are numerous as well, these including those operated by hand levers, by foot pedals, by springs, by switches and by press buttons, utilizing electricity, acetylene gas, mixtures of gasoline and air, and compressed air. The systems vary decidedly, some of them requiring tanks and piping to serve each cylinder, while others are remarkably simple and light.

The utilization of these starting devices makes it possible for the driver to escape the labor of cranking a motor, and in this respect cars that are now too large for a woman to start will become as easy to start as an electric vehicle. Most of these starters are comparatively light in weight and no installation detracts from the appearance of a car. Practically all are concealed and add but little to the attention that is necessary.

It can be said that practically every starter has been developed with a view of adding it to any existing car, and that with one or two exceptions installations may be made at small expense for the actual labor.

Many of the manufacturers of cars, in fact about 60 in all, have thus far equipped their 1912 machines with starters, and it is probable that within a short time this number will be considerably increased. Some manufacturers are offering the starters as optional equipment. Others make a charge of the installation included in the price of the cars. The cars, however, range from moderate to high prices, the installation being by no means an indication of cost.

As an auxiliary or accessory to cars already existing the market for such devices is seemingly unlimited. There is a very great number of cars in use—probably half a million—and to a large proportion of these starters may be added. This is a market that can be exploited with a certainty of returns, and which is open to all those engaged in any business that will bring them in contact with the motorists. It should be understood that it is not necessary as a rule to have special facilities to make such installations, and ordinarily intelligent mechanics can undertake such work with satisfactory results.

To what extent starters will be demanded upon service vehicles is uncertain. It is a fact, however, that some of the manufacturers will include them as regular equipment, this auxiliary being regarded as necessary to facilitate service and more nearly continous operation.

COL. J. H. SPRAGUE DEAD.

Col. James H. Sprague, who was one of the best known manufacturers in the industries allied to motor vehicle production, died recently at Norwalk, O., after a lengthy illness. He was president of the Sprague Umbrella Company and manufactured tops, covers and windshields. He was a soldier in the civil war and was one of the most enthusiastic of veterans.

INDUSTRIAL ACTIVITIES IN INDIANA.

Summarized Facts Concerning the Manufacturers and Distributors of Power Vehicles and Equipment.

Application has been made in the Marion county superior court at Indianapolis, by Harold S. Block, Wheeling, W. Va., a stockholder, for the appointment of a receiver for the Mais Motor Truck Company on the ground of insolvency. The allegation is made the company owes $144,000 and that its operations should be under court control. President Will H. Brown maintains that the company's assets exceed its liabilities by $130,000, that its business is good and that the proceeding was actuated through pique by a small stockholder. The court authorized the completion of six trucks.

The Premier Motor Manufacturing Company, Indianapolis, has produced a two-ton power wagon which is to be built as stock. The motor is a four-cylinder type. The construction differs entirely with the Premier pleasure machines. The wagon has pneumatic tire equipment and is to be furnished with any type of body.

Want Every Manufacturer Represented.

The Indianapolis Trade Association and the Hoosier Motor Club is endeavoring to induce every Indiana motor vehicle builder, not already represented, to establish an office or a salesroom with service station in that city.

John W. Hayden, who resigned as general manager for the United Motors Indianapolis Company because of ill health, has been succeeded by Thomas Marshall of Detroit.

A. F. Mais, who resigned as chief engineer of the Mais Motor Truck Company, has become consulting engineer of the Studebaker Corporation and is attached to the Detroit experimental division of that concern.

The shows made in the salesrooms of the members of the Indianapolis Automobile Trade Association of the latest models of cars was entirely successful and was productive of considerable business.

Empire to Move to Detroit.

According to Carl G. Fisher the Empire Motor Car Company will be removed from Indianapolis to Detroit.

On petition of Theodore M. Weiss, a stockholder, representing that the Star Motor Car Company, Indianapolis, was insolvent, George Lehnert has been appointed receiver of that concern. The company was organized a year ago and has built but one car.

New buildings are to be erected at Anderson to manufacture the Peters electric headlight for locomotives, the business of the R. G. Peters Company having been purchased by the Remy Electric Company and that division removed to Anderson.

According to announcement 2500 Overland cars will be built at the Indianapolis plant of the company for the 1912 season.

New Amplex Car Coming.

The Simplex Motor Car Company, Mishawaka, has completed designs for the production of a 40 horsepower car with a five-passenger body which is to be known as the Baby Amplex. It will have a four-cylinder two-cycle motor. Plans are making for the enlarging of the plant for the production of 1000 of these cars annually, as well as 300 of the standard Amplex types.

With capital of $10,000 the Studebaker Corporation of America has received authority to do business in this state. The company is capitalized for $100,000 in New Jersey and represents the $45,000,000 Studebaker concern, which has a big plant at South Bend.

Will Make Starting Equipment.

A factory at 427 North Meridian street, Indianapolis, is being equipped for the Motor Starting Company to manufacture self-starting equipment for motor vehicles. L. W. Cooper is president of the company. The invention is to install an auxiliary fuel supply to a small carburetor located in the floor of the car near the driver, and to pipe each cylinder so that by means of a hand pump gas is furnished each cylinder, in sufficient volume and compression to fire from the spark generated. The company has been incorporated for $1,000,000 under Delaware laws.

With capital of $10,000 the Antidam Manufacturing Company has been incorporated at Indianapolis by R. P. Irwin, J. M. Irwin and George Bott, and has engaged in the manufacture of a heat retaining radiator cover. George Bott is secretary, treasurer and general manager of the company.

Will Build Pleasure and Service Vehicles.

The American Automobile Manufacturing Company, New Albany, of which George H. Wilson of Louisville, Ky., is now president, will begin to produce cars the first of the year. The purpose of the company is to build a complete line of pleasure cars and light and heavy power wagons for service. These will have Jonz two-cycle and Jonz four-cycle water-cooled motors.

The Warner Gear Company, Muncie, has secured the manufacturing rights for the United States for the Lanchester worm gear drive system from English patent owners and will manufacture the drives and differentials, not the complete axles.

The Empire Gear and Manufacturing Company has been organized at Indianapolis with capital of $20,000, which may be increased to $250,000 if conditions justify, with Frank S. Clark as president, Charles N. Hurd vice president, Howard M. Talbot secretary, Albert H. Off treasurer, and Wesley Haufler general superintendent. The company will begin the production of motors and transmissions the first of the year.

The Fisher-Gibson Company entertained more than 75 Indiana Overland agents at Indianapolis Dec. 12. John N. Willys, president of the Willys-Overland Company, and several officers of that company were included among the guests.

DEATH OF PROF. WARREN S. JOHNSON.

Following an illness of more than two years Prof. Warren S. Johnson, president and treasurer of the Johnson Service Company, Milwaukee, Wis., died Dec. 5 at Los Angeles, Cal. Prof. Johnson was noted as an inventor and engineer. His company is the largest maker of thermostats and scientific heating apparatus and pneumatic clocks in the world, and has been engaged for years in the manufacture of pleasure cars and service wagons. Prof. Johnson was the first to advocate and promote the use of automobile vehicles in postal service.

WILL MANUFACTURE SPARK PLUGS.

The Hartford Machine Screw Company, Hartford, Conn., which has for years made the metal parts for spark plugs for other manufacturers, is about to engage in the manufacture of what will be known to the trade as the H. M. C. spark plug, and later this will be followed by another at a cheaper price. It is stated that the quality will be high and the prices such as will command attention.

Two trucks have been built by the New Britain Machine Company, New Britain, Conn., to specifications that closely follow those of a well known English machine. The trucks were to a special order.

WITH THE MICHIGAN INDUSTRIES.

Activities of the Automobile and Allied Interests Throughout the Wolverine State.

W. E. Metzger, president of the Metzger Motor Car Company, Detroit, has named as his assistant C. F. Garaghty, who was recently assistant treasurer of the E-M-F Company.

The capital of the Hildreth Manufacturing Company, Lansing, has been increased from $75,000 to $112,500. This concern produces gasoline motors and air pumps.

The new testing shed for the Hudson Motor Car Company, Detroit, which is now building by the A. J. Smith Construction Company, is to be two stories and 500 by 50 feet.

General Manager Mead of the Olds Motor Works, Lansing, has appointed as his assistant O. G. Baker, an automobile engineer of considerable experience.

The Jackson Automobile Company, Jackson, has developed a new body type, this being a coupe which is installed on chassis of 118 inches wheelbase and fitted with 34-inch wheels and tires. The car is left side control with levers in the centre. The vehicle is lighted entirely by electricity.

Electric power wagons of differing capacities are to be produced by the Hupp Corporation, Detroit, and in addition there has been announcement of the building of bodies of varying sizes and elegance for equipment of the Hupp-Yeats chassis, which is already a well known standard car. These bodies will, it is stated, exceed anything the company has yet produced as stock creation in every detail of construction, upholstery and finish.

Regal to Make Delivery Wagons.

The Regal Motor Car Company, Detroit, has begun the manufacture of light open and enclosed express bodies which it is installing on chassis similar to those for pleasure car bodies. These vehicles are intended for fast commercial service and are not for carrying heavy loads.

The steering gear product of the Lavigne Gear Company, which has absorbed the Lavigne Steering Gear Company of Detroit, will be manufactured at Corliss, Wis., near Milwaukee, which will relieve the plant of the Lavigne Manufacturing Company for other products.

The Chevrolet Motor Company, Detroit, has the following organization: President, William H. Little, Flint, Mich.; vice president and treasurer, Dr. E. R. Campbell, Detroit; secretary, Curtis R. Hathaway, Detroit; designer and consulting engineer, Louis Chevrolet, Detroit; assistant secretary and treasurer, W. W. Murphy, Detroit. The concern is to build the Chevrolet six-cylinder car. The company has increased its capital from $100,000 to $2,500,000 to insure adequate facilities, it is stated.

Doubles Factory Capacity.

Knell & Adams, body finishers, Detroit, has acquired the property of Burnham, Stoepel & Co., at 1039-43 Jefferson avenue, which includes a two-story factory that is to be remodelled, affording an increase of about 100 per cent. production. The company will continue the use of the old factory at 1020-30 Beaufeit street.

D. W. Connell, widely known in the West through association with vehicle trade, is now associated with the Oakland Motor Car Company, Pontiac.

Included among the new Detroit corporations are the Security Motor Switch Company with capital of $10,000, and the Simpson Fiber Tire Company with capital of $100,000.

Grover C. Farnsworth, well known as a writer, has been placed in charge of the advertising and publicity department of the Briggs-Detroiter Company, which is soon to place in the market a small runabout. Mr. Farnsworth is a graduate of the engineering department of the University of Michigan.

New Hupp Factory Contracted For.

E. P. Decker & Co. has been awarded contract to erect the new buildings for the Hupp Motor Car Company at Milwaukee and Mount Elliott avenues, Detroit.

The Ignition Starter Company has removed to Detroit from Grand Rapids and will increase its production from 200 to 400 starters a day. J. W. Fitzgerald is president and designer of the concern which makes the Disco starter.

Will Remove Plant to Detroit.

The Hoskins Manufacturing Company, Detroit, has purchased the business and equipment of the International Electric Motor Company, Chicago, Ill., and has removed it to Detroit, where the production of electrical specialties will be continued.

The Detroit branch of the Bosch Magneto Company is located at 1250-2 Woodward avenue and it includes an office, salesroom, repair shop and laboratory and garage, all with adequate facilities.

Receiver for New Dyke Company.

The Security Trust Company is receiver for the Van Dyke Motor Car Company, Detroit, which, after first being an involuntary respondent to bankruptcy proceedings instituted by three creditors, filed a voluntary petition in bankruptcy. The liabilities were stated as $143,090.02, and the assets as $90,329.85, the latter including bills receivable and other securities and machinery, tools and equipment. Lack of capital has been the cause of the company's embarrassment. It is expected that the business will be disposed of and that possibly reorganization will take place.

Additions with about 30,000 square feet of floor space have been made to the plant of the Abbott Motor Company, Detroit, including a two-story structure devoted to final assembly, and liberal increases of area for chassis assembling and the office force. Fire protection has been improved by installation of a sprinkler system and a large supply tank.

Ford Production Doubled.

The production of the Ford Motor Company, Detroit, is claimed as being 100 per cent. more for November than it was for the corresponding month of last year, about 4000 cars having been shipped during the period.

The Imperial Automobile Company, Jackson, has appointed A. J. Rousseau, formerly with the General Motors Company, as sales manager of its western district.

A branch establishment has been created at Hamburg, Germany, by the Ford Motor Company.

The Republic Rubber Company of Michigan has been organized and will distribute Republic tires and tubes in the state. The Detroit office and salesrooms are at 1001 Woodward avenue.

K-R-I-T Cars Shipped Abroad.

The K-R-I-T Motor Car Company has recently shipped 73 cars to foreign countries, of which 50 went to Great Britain.

L. J. Fasquelle is now general sales manager of the General Motors Company, and has charge of the distribution of the Rapid and Reliance trucks, while the service department is directed by T. P. Myers, formerly sales manager of the Rapid company.

Walter E. Flanders has become president of the Flanders Manufacturing Company, Pontiac, succeeding Robert M. Brownson, and having associated with him the following officers: Vice president, A. O. Smith, Milwaukee, Wis.; secretary-treasurer, H. L. Stanton; assistant secretary-treasurer, James B. Book, Jr.; general manager, Don C. McCord. George W. Sherman has retired as sales manager for the company.

RESULTS OF 1911 RACING SEASON.

Winners and Place Cars in Year's Important Long Distance Events--How the Drivers Finished--Positions Gained by Different Makes of Cars--World's Records Accepted by Contest Board--Drivers of National Note.

LONG DISTANCE ROAD RACES, 1911.

Car	Driver	Miles	Time	M.P.H.
Ferris Cup, Santa Monica, Cal., Oct. 14.				
National,	Herrick	202.0	2:42:27.60	74.62
Marmon,	Patschke	202.0	2:45:42.73	73.24
Marmon,	Dawson	202.0	2:47:54.53	72.16
Grand Prize, Savannah, Ga., Nov. 30.				
Fiat,	Bruce-Brown	411.3	5:31:39.13	74.43
Benz,	Hearne	411.3	5:33:37.07	73.99
Mercedes,	De Palma	411.3	5:34:40.80	73.75
Shettler Cup, Santa Monica, Cal., Oct. 14.				
National,	Merz	151.5	2:02:08.45	74.42
Pope-Hartford,	Dingley	151.5	2:03:26.30	73.64
Stutz,	Lewis	151.5	2:04:56.95	72.18
Vanderbilt Cup, Savannah, Ga., Nov. 27.				
Lozier,	Mulford	291.3	3:56:00.67	74.07
Mercedes,	De Palma	291.3	3:58:11.95	73.39
Mercedes,	Wishart	291.3	4:06:20.37	70.97
Jepson Cup, Santa Monica, Cal., Oct. 14.				
Marmon,	Keene	151.5	2:12:09.95	68.70
Marmon,	J. Nikrent	151.5	2:13:03.50	68.32
Mercer,	Hanshue	151.5	2:13:41.20	67.99
Savannah Challenge Cup, Savannah, Ga., Nov. 27.				
Mercer,	Hughes	222.8	3:15:37.92	68.34
Marmon,	Heinemann	222.8	3:21:41.49	66.28
Marmon,	J. Nikrent	222.8	3:24:42.93	65.30
St. Francis Trophy, Alameda, Cal., Feb. 22.				
National,	Merz	152.9	2:17:20.00	66.82
Pope-Hartford,	Dingley	152.9	2:18:07.00	66.46
Pope-Hartford,	Fleming	152.9	2:19:21.00	65.84
Elgin Trophy, Elgin, Ill., Aug. 26.				
National,	Zengel	305.0	4:35:39.00	66.41
Alco,	Grant	305.0	4:41:58.00	64.93
Mercer,	Hughes	305.0	4:42:09.00	64.88
Illinois Trophy, Elgin, Ill., Aug. 25.				
National,	Herr	203.5	3:05:35.00	65.81
National,	Merz	203.5	3:06:04.00	65.62
Free-for-All, Alameda, Cal., Feb. 22.				
Pope-Hartford,	Dingley	163.9	2:29:30.00	65.80
National,	Merz	163.9	2:32:12.00	64.63
*Pope-Hartford,	Fleming	152.9	2:31:01.40	51.64
Kane County Trophy, Elgin, Ill., Aug. 25.				
Mercer,	Hughes	169.4	2:37:21.00	64.60
Mercer,	Barnes	169.4	2:39:55.00	63.56
Colby,	Pearce	169.4	2:46:17.00	61.13
Sweepstakes, Fairmount Park, Philadelphia, Oct. 9.				
Benz,	Bergdoll	202.5	3:18:41.35	61.16
Lozier,	Mulford	202.5	3:21:52.78	60.19
National,	Zengel	202.5	3:25:59.36	58.99
Class 6C, Fairmount Park, Philadelphia, Oct. 9.				
Benz,	Bergdoll	202.5	3:18:41.35	61.16
Class 5C, Fairmount Park, Philadelphia, Oct. 9.				
Lozier,	Mulford	202.5	3:21:52.78	60.19
National,	Zengel	202.5	3:25:59.36	58.99
Lozier,	Grant	202.5	3:28:50.37	58.19
Chanslor & Lyon Trophy, Santa Monica, Cal., Oct. 14.				
Buick,	L. Nikrent	101.0	1:43:21.70	59.20
Ford,	Charles	101.0	1:45:22.85	57.21
E-M-F,	Seibel	101.0	1:55:50.20	52.30
Class 4C, Fairmount Park, Philadelphia, Oct. 9.				
National,	Disbrow	202.5	3:28:22.32	58.32
Stutz,	Anderson	202.5	3:40:23.05	55.13
National,	Herr	202.5	3:40:33.87	54.89
Class 3C, Fairmount Park, Philadelphia, Oct. 9.				
Mercer,	Hughes	202.5	3:29:45.30	57.87
*Ohio,	Matthews	178.2	3:35:21.00	49.65
*Ohio,	Parker	162.0	3:34:34.00	45.17
Tiedeman Trophy, Savannah, Ga., Nov. 27.				
E-M-F,	Witt	171.4	2:59:19.34	57.53
E-M-F,	Evans	171.4	3:00:21.34	57.06
E-M-F,	Tower	171.4	3:01:33.84	56.64
Cincinnati Trophy, Cincinnati, O., Sept. 9.				
Fiat,	Hearne	200.0	3:29:03.20	57.40
Cole,	Jenkins	200.0	3:40:04.27	54.54
Westcott,	Knight	200.0	3:53:38.75	51.49
Sable Natural Speedway, Denver, Col., May 30.				
National,	McMillan	200.0	3:30:30.60	57.01
Ford,	Torney	200.0	3:51:40.00	51.80
Oakland,	McDonald	200.0	....	....
Aurora Cup, Elgin, Ill., Aug. 25.				
Abbott-Detroit,	Roberts	137.5	2:31:11.00	54.59
Ford,	Kulick	137.5	2:39:11.00	51.85
Abbott-Detroit,	Robbins	137.5	2:46:56.00	49.45
Hamilton Trophy, Cincinnati, O., Sept. 9.				
Cole,	Jenkins	150.0	2:46:29.84	54.07
Ohio,	Thatcher	150.0	2:51:19.02	52.54
Cino,	Gilchrist	150.0	3:00:29.00	49.87
Levis Trophy, Bakersfield, Cal., July 4.				
National,	Herrick	156.1	2:58:58.20	52.35
Pope-Hartford,	Dingley	156.1	3:01:58.00	51.48
Mercer,	Siefert	156.1	3:16:15.00	47.73
Light Cars, Bakersfield, Cal., July 4.				
Buick,	L. Nikrent	100.3	2:15:00.60	44.58
Chalmers,	Weathers	100.3	2:19:44.60	43.08
Ford,	Packard	100.3	2:44:42.20	36.11
Desert Race, Los Angeles-Phoenix, Nov. 3-6.				
National,	Herrick	518.0	21:05:30.00	24.47
Franklin,	Hamlin	518.0	23:35:00.00	22.39
Midland,	Carrigan	518.0	24:59:00.00	21.14

LONG DISTANCE BEACH RACES, 1911.

Jacksonville, Fla., March 28.				
Pope-Hartford,	Disbrow	100.0	1:15:25.39	80.10
Buick,	Burman	100.0	....	....
National,	Wilcox	100.0	....	....
Jacksonville, Fla., March 31.				
Pope-Hartford,	Disbrow	300.0	3:53:33.50	77.08
National,	Merz	300.0	4:15:19.00	70.50
*Mercer,	Hughes	270.0	3:57:51.00	68.11
Free-for-All, Galveston, Tex., Aug. 5.				
National,	Zengel	150.0	2:06:06.00	71.39
National,	Rader	150.0	2:10:36.00	68.94
Inter-State,	Endicott	150.0	2:44:15.00	54.80
451-600 Inches, Galveston, Tex., Aug. 5.				
National,	Zengel	150.0	2:06:06.00	71.39
301-450 Inches, Galveston, Tex., Aug. 5.				
National,	Rader	150.0	2:10:36.00	68.94
Inter-State,	Endicott	150.0	2:44:15.00	54.80
Old Orchard Beach, Me., Sept. 6.				
National,	Rutherford	100.0	1:38:00.08	61.24
Pope-Hartford,	Disbrow	100.0	1:39:18.00	60.42
Pope-Hartford,	Holt	100.0	1:44:37.00	57.43
131-230 Inches, Galveston, Tex., Aug. 5.				
Ford,	Hoffman	150.0	3:00:01.00	49.99

LONG DISTANCE SPEEDWAY RACES, 1911.

Match, Los Angeles, March 19.				
Lozier,	Tetzlaff	100.0	1:14:29.20	81.08
Fiat,	De Palma	100.0	....	....
Memorial Day, Indianapolis, Ind., May 30.				
Marmon,	Harroun	500.0	6:42:08.00	74.59
Lozier,	Mulford	500.0	6:43:51.00	74.33
Fiat,	Bruce-Brown	500.0	6:52:29.00	73.16
Los Angeles, Cal., April 9.				
Fiat,	Verbeck-Hirsch	1491.0	24:00:00.00	62.12
Cadillac,	Adair-Beaudet	1448.0	24:00:00.00	60.33
Cole,	Edmunds-Jenkins	1219.0	24:00:00.00	50.79

LONG DISTANCE DIRT TRACK RACES, 1911.

Amarillo, Tex., Sept. 5.				
National,	Wilcox	100.0	1:36:52.00	61.94
Staver-Chicago,	Monckmeier	100.0	1:43:15.00	58.24
Staver-Chicago,	Nikrent	100.0	....	....
Hoster-Columbus Trophy, Columbus, O., Sept. 13.				
Westcott,	Knight	200.0	3:45:00.00	53.66
Jackson,	M. Borst	200.0	4:15:00.00	47.06
Jackson,	J. Borst	200.0	4:16:00.00	46.94

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*Running when race was called off Time and mileage given for completed laps only.

HOW DRIVERS FINISHED IN 1911 RACE MEETS.

Name	Starts	1st	2nd	3rd	Name	Starts	1st	2nd	3rd	Name	Starts	1st	2nd	3rd
De Palma	46	30	4	8	Hanshue	6	1	0	2	Gilchrist	3	1	0	2
Disbrow	38	8	13	10	Ferguson	6	0	1	2	Robinson	3	1	0	2
Burman	37	24	6	1	Ringler	5	4	1	0	Kent	3	0	3	0
Hughes	32	12	11	7	Sutherland	5	4	1	0	Meddock	3	0	3	0
Wilcox	28	14	9	5	Farr	5	3	0	1	Morton	3	0	2	1

David Bruce-Brown.

Ralph Mulford.

Ray Harroun.

Cyrus Patschke.

Merz	26	6	6	6	Bergdoll	5	2	2	0	Irwin	3	0	1	2
Raimey	22	16	2	2	Heisey	5	2	0	3	Johnson	3	0	1	2
Kulick	22	10	6	3	Limberg	5	1	2	0	Knudson	3	0	1	2
Tower	19	12	2	3	Bigelow	5	1	1	0	Nyquist	3	1	1	0
Knipper	18	3	9	4	Fritsch	5	1	0	0	Bruce-Brown	3	1	0	1
Heinemann	17	4	8	5	Baker	5	0	4	1	Burt	3	1	0	1
Jagersburger	16	6	5	3	Tucker	5	0	1	2	Knight	3	1	0	1
McNay	15	4	4	5	Cohen	5	0	0	2	Soules	3	1	0	1
Endicott, H.	14	4	0	4	Ireland	5	0	0	0	Mustain	3	0	2	0
Monckmeier	14	2	6	5	Harroun	4	4	0	0	Dawson	3	0	1	1
Zengel	13	9	3	1	Rutherford	4	3	1	0	Fleming	3	0	0	2
Dingley	11	5	5	0	Herr	4	3	0	1	Tetzlaff	3	1	0	0
Donnelly	11	3	6	2	Herrick	4	3	0	0	Bowler	3	0	0	1
Sheets	11	2	2	4	Bragg	4	2	1	0	Jeffkins	3	0	0	1
Roberts	10	3	5	1	Habich	4	2	1	0	Raycliff	3	0	0	1
Pearce	10	2	7	1	Ormsby	4	1	3	0	Basle, C.	3	0	0	0
Aitken	10	2	3	2	Grannon	4	1	2	1	Speer	3	0	0	0
Kilpatrick	10	0	1	8	Parker	4	1	1	1	Clark	2	2	0	0
Cobe	10	0	2	1	Stickney	4	1	0	2	DeWitt	2	2	0	0
Nikrent, J.	9	2	3	2	Frayer	4	1	1	0	Hoffman	2	2	0	0
Maisonville	9	1	1	6	Patschke	4	1	1	0	Keene	2	1	1	0
Craig	9	0	4	4	Dearborn	4	0	1	2	Knopman	2	1	1	0
Rouse	9	0	3	3	Grant	4	0	1	1	Russell	2	1	1	0
Nikrent, L.	8	3	2	1	Smith	4	0	1	1	Thorney	2	1	1	0
Reeves	8	2	1	4	Strang	4	0	1	0	Walker	2	1	1	0
Evans	8	0	5	0	Turner	4	0	1	0	Hillard	2	1	0	1
Duby	8	0	1	0	David	3	3	0	0	Oberling	2	1	0	1
Wilson	7	1	3	2	Swanson	3	2	1	0	Sandel	2	1	0	1
Jenkins	7	1	2	1	O'Brien	3	2	0	0	Whelan	2	1	0	1
Meleun	7	0	4	3	Burke	3	1	2	0	Lund	2	0	1	1
Oldfield, L.	7	0	3	3	Cooper	3	1	2	0	Matthews	2	0	1	1
					Martin	3	1	2	0					

Louis Disbrow.

Harry Cobe.

John McNay.

Joseph Jagersburger.

Wishart	7	0	0	3	Maxwell	3	1	2	0	Stanton	2	0	1	1
Borsch	6	2	2	1	Schillo	3	1	2	0	Triplett	2	0	1	1
Mulford	6	2	1	0	Ammerman	3	1	1	1	Fulton	2	0	2	0
Witt	6	2	0	0	Du Closne	3	1	1	1	Fouts	2	0	2	0
Haupt	6	1	4	1	Gray	3	1	1	1	McHugh	2	0	2	0
Hearne	6	1	4	0	Seifert	3	1	1	1	Rader	2	0	2	0

Spencer Wishart.

Harry Knight.

Ralph De Palma.

Harry Grant.

Name	Starts	1st	2nd	3rd	Name	Starts	1st	2nd	3rd	Name	Starts	1st	2nd	3rd
Thatcher	2	0	2	0	McMillan	1	1	0	0	Snader	1	0	1	0
Ainslee	2	0	0	2	Nygard	1	1	0	0	Weathers	1	0	1	0
Ralston	2	0	0	2	Rowan	1	1	0	0	Birtley	1	0	0	1
Anderson	2	0	1	0	Tyron	1	1	0	0	Borst, J.	1	0	0	1
Beardsley	2	0	1	0	Verbeck	1	1	0	0	Brunning	1	0	0	1
Barnes	2	0	1	0	Adair	1	0	1	0	Carrigan	1	0	0	1
Fox	2	0	1	0	Beauder	1	0	1	0	De Hart	1	0	0	1
Speigel	2	0	1	0	Borst, M.	1	0	1	0	Edmundson	1	0	0	1
Jones, W.	2	0	0	1	Charles	1	0	1	0	Forster	1	0	0	1
Jessop	2	0	0	1	Curtiss	1	0	1	0	Frahley	1	0	0	1
Lewis	2	0	0	1	Day	1	0	1	0	Geary	1	0	0	1
Robillard	2	0	0	1	Foster	1	0	1	0	Holt	1	0	0	1
Ball	2	0	0	0	Gillam	1	0	1	0	Juhaz	1	0	0	1
Hartman	2	0	0	0	Hamlin	1	0	1	0	McDonald	1	0	0	1
Haycroft	2	0	0	0	Isenberg	1	0	1	0	Packer	1	0	0	1
Lacasse	2	0	0	0	Krise	1	0	1	0	Payne	1	0	0	1
Mitchell, L.	2	0	0	0	McCullen	1	0	1	0	Robbins	1	0	0	1
Brunner	1	1	0	0	Merrill	1	0	1	0	Seibel	1	0	0	1
Collins	1	1	0	0	Monroe	1	0	1	0	Strakle	1	0	0	1
De Vore	1	1	0	0	Mitchell, N.	1	0	1	0	Strong	1	0	0	1
Heitmeyer	1	1	0	0	Padula	1	0	1	0	Adams	1	0	0	0
Hirsch	1	1	0	0	Pauls	1	0	1	0	Anthony	1	0	0	0
Hognson	1	1	0	0	Ritchell	1	0	1	0	Armstrong	1	0	0	0
McClean	1	1	0	0	Shipp	1	0	1	0	Aurandt	1	0	0	0

Howard Wilcox.

Mortimer Roberts.

Herbert Lytle.

John Jenkins.

Robert Burman.

Teddy Tetslaff.

Harvey Herrick.

Edward Hearne.

Name	Starts	1st	2nd	3rd
Barry	1	0	0	0
Belcher	1	0	0	0
Benedict	1	0	0	0

Charles Merz.

Name	Starts	1st	2nd	3rd
Betz	1	0	0	0
Bramlette	1	0	0	0

Name	Starts	1st	2nd	3rd
Buck	1	0	0	0
Buckley	1	0	0	0
Burdick	1	0	0	0
Carter	1	0	0	0
Chevrolet, A.	1	0	0	0
Delaney	1	0	0	0
Dequelin	1	0	0	0
Ellis	1	0	0	0
Fletcher	1	0	0	0
Fouch, H.	1	0	0	0
Fouch, J.	1	0	0	0
Grenier	1	0	0	0
Hall	1	0	0	0
Hemery	1	0	0	0
Kelley	1	0	0	0
Larkin	1	0	0	0
Lawwell	1	0	0	0
Lee	1	0	0	0
Lytle	1	0	0	0
Miller	1	0	0	0
Morris	1	0	0	0
Ogren	1	0	0	0
Perry	1	0	0	0
Shearns	1	0	0	0
Matson	1	0	0	0
McKeague	1	0	0	0
Michener	1	0	0	0

Name	Starts	1st	2nd	3rd
Tremaine	1	0	0	0
Wagner	1	0	0	0

Gilbert Anderson.

Name	Starts	1st	2nd	3rd
Wallace	1	0	0	0
Walling	1	0	0	0

POSITIONS GAINED BY DIFFERENT MAKES OF CARS.

Make	Starts	First	Second	Third
National	122	50	30	19
Buick	73	21	10	18
Pope-Hartford	49	9	19	12
Mercer	48	20	13	8
Simplex	39	26	5	4
Cino	38	12	9	8
E-M-F	36	11	5	7
Ford	34	13	7	4
Cole	34	4	11	6
Warren-Detroit	26	6	7	3
Benz	23	11	7	1
Fiat	23	8	8	3
Jackson	23	0	5	3
Inter-State	22	4	4	5
Case	21	5	5	4
Mercedes	19	4	10	1
Cutting	19	4	2	7
Marmon	18	2	8	3
Abbott-Detroit	16	5	6	2
Staver-Chicago	16	3	4	5
Schacht	14	3	2	2
Regal	14	1	2	4
Midland	14	0	1	1
Ohio	12	1	3	2
Lancia	12	1	2	4
Paige-Detroit	11	2	4	3
Hotchkiss	10	0	0	7
Fal-Car	9	2	7	0
Corbin	9	1	1	6
Opel	8	5	1	0
Cadillac	7	3	1	0
Maxwell	7	2	3	0
Firestone-Columbus	7	2	1	1
Lozier	7	2	1	1
Kline-Kar	7	1	4	4
Chalmers	7	1	3	2
Velie	6	2	0	0
Knox	6	1	0	3
Marion	6	0	3	0
Stutz	6	0	1	3
Reo	6	0	1	3
Amplex	5	0	2	0
Correja	5	0	2	0
Franklin	4	1	2	0
Empire	4	0	3	0
Alco	4	0	1	0
Pullman	4	0	1	0
Colby	4	0	0	1
S. P. O.	3	1	0	1
Metz	3	0	1	2
Flanders	3	0	1	0
Penn	3	0	0	2
Westcott	2	1	0	1
Hupmobile	2	0	1	0
Stoddard-Dayton	2	0	1	0
Badger	2	0	0	2
Moon	2	0	0	1
Matheson	2	0	0	1
Lexington	2	0	0	0
Overland	2	0	0	0
Apperson	2	0	0	0
Stearns	1	1	0	0
Oakland	1	0	0	1
Palmer-Singer	1	0	0	1
De Tamble	1	0	0	1
Cameron	1	0	0	0
Croxton	1	0	0	0
Haynes	1	0	0	0
Darracq	1	0	0	0
Rainier	1	0	0	0
Durocar	1	0	0	0
Locomobile	1	0	0	0
Sunset	1	0	0	0
Everitt	1	0	0	0
Michigan	1	0	0	0
Ferguson	1	0	0	0

WORLD'S RECORDS RECOGNIZED BY CONTEST BOARD.

One Mile, Circular Dirt Track.

Distance	Car	Driver	Place	Date	Time
1 mile	Benz	Robert Burman	Brighton Beach, L. I.	Sept. 4, 1911	0:48.62
2 miles	Benz	Robert Burman	Brighton Beach, L. I.	Sept. 2, 1911	1:37.89
3 miles	Fiat	Ralph De Palma	Syracuse, N. Y.	Sept. 17, 1910	2:30.55
4 miles	Fiat	Ralph De Palma	Syracuse, N. Y.	Sept. 17, 1910	3:22.27
5 miles	Fiat	Ralph De Palma	Syracuse, N. Y.	Sept. 17, 1910	4:11.90
10 miles	Fiat	Ralph De Palma	Narbeth, Penn.	Sept. 24, 1910	8:31.20
15 miles	Darracq	Barney Oldfield	Milwaukee, Wis	Sept. 27, 1910	13:41.40
20 miles	Darracq	Barney Oldfield	Milwaukee, Wis	Sept. 27, 1910	18:15.00
25 miles	Darracq	Barney Oldfield	Milwaukee, Wis	Sept. 27, 1910	22:47.00
50 miles	Simplex	Ralph De Palma	Syracuse, N. Y.	Sept. 16, 1911	47:21.65
75 miles	Buick	Lewis Strang	Columbus, O.	July 3, 1909	1:19:39.00
100 miles	Buick	Lewis Strang	Columbus, O.	July 3, 1909	1:41:00.40

Speedway—Regardless of Class.

Distance	Car	Driver	Place	Date	Time
.25 mile	Benz	Robert Burman	Indianapolis, Ind	May 29, 1911	0:08.16
.5 mile	Benz	Robert Burman	Indianapolis, Ind	May 29, 1911	0:16.80
1 kilo	Benz	Robert Burman	Indianapolis, Ind.	May 29, 1911	0:21.40
1 mile	Benz	Robert Burman	Indianapolis, Ind.	May 29, 1911	0:35.35
2 miles	Fiat	Caleb Bragg	Los Angeles, Cal.	April 13, 1910	1:15.96
5 miles	Fiat	Ralph De Palma	Los Angeles, Cal.	April 8, 1910	3:15.62
10 miles	Simplex	George Robertson	Los Angeles, Cal.	April 9, 1910	6:35.62
15 miles	Benz	Edward Hearne	Indianapolis, Ind.	July 4, 1910	10:25.17
20 miles	Benz	Edward Hearne	Indianapolis, Ind.	July 4, 1910	14:05.72

(Continued on Next Page.)

RECORDS RECOGNIZED BY CONTEST BOARD, CONT.

Distance.	Car	Driver	Place	Date	Time
25 miles	Lozier	Teddy Tetzlaff	Los Angeles, Cal	March 19, 1911	18:22.60
50 miles	Lozier	Teddy Tetzlaff	Los Angeles, Cal	March 19, 1911	36:35.80
75 miles	Lozier	Teddy Tetzlaff	Los Angeles, Cal	March 19, 1911	54:50.20
100 miles	Lozier	Teddy Tetzlaff	Los Angeles, Cal	March 19, 1911	1:14:29.20
150 miles	Fiat	David Bruce-Brown	Indianapolis, Ind	May 30, 1911	1:57:15.00
200 miles	Fiat	David Bruce-Brown	Indianapolis, Ind	May 30, 1911	2:39:28.00
250 miles	Fiat	David Bruce-Brown	Indianapolis, Ind	May 30, 1911	3:17:49.00
300 miles	Marmon	Ray Harroun	Indianapolis, Ind	May 30, 1911	4:01:25.00
350 miles	Lozier	Ralph Mulford	Indianapolis, Ind	May 30, 1911	4:42:38.00
400 miles	Marmon	Ray Harroun	Indianapolis, Ind	May 30, 1911	5:23:15.00
450 miles	Lozier	Ralph Mulford	Indianapolis, Ind	May 30, 1911	6:03:01.00
500 miles	Marmon	Ray Harroun	Indianapolis, Ind	May 30, 1911	6:42:08.00
Speedway—Class B—160 Inches and Under.					
1 mile	Flanders	Frank Witt	Indianapolis, Ind	Nov. 13, 1911	0:56.80
5 miles	Flanders	Frank Witt	Indianapolis, Ind	Nov. 13, 1911	4:22.98
10 miles	Flanders	Frank Witt	Indianapolis, Ind	Nov. 13, 1911	9:27.49
15 miles	Flanders	Frank Witt	Indianapolis, Ind	Nov. 13, 1911	14:13.26
20 miles	Flanders	Frank Witt	Indianapolis, Ind	Nov. 13, 1911	19:00.87
Speedway—Class B—161-230 Inches.					
4 miles	E-M-F	Frank Witt	Atlanta, Ga	Nov. 3, 1910	3:49.00
5 miles	Buick	Louis Chevrolet	Indianapolis, Ind	July 2, 1910	4:35.47
10 miles	Buick	Louis Chevrolet	Indianapolis, Ind	July 2, 1910	8:55.40
20 miles	Chalmers	William Knipper	Atlanta, Ga	Nov. 12, 1909	19:51.00
50 miles	Buick	——— Nelson	Atlanta, Ga	Nov. 9, 1909	50:36.00
100 miles	Chalmers	William Knipper	Atlanta, Ga	Nov. 10, 1909	1:40:46.81
Speedway—Class B—231-300 Inches.					
5 miles	Marmon	Joseph Dawson	Indianapolis, Ind	July 2, 1910	0:04.16
10 miles	Marmon	Ray Harroun	Indianapolis, Ind	May 27, 1910	8:16.08
25 miles	Marmon	Ray Harroun	Indianapolis, Ind	May 30, 1910	21:48.92
50 miles	Marmon	Ray Harroun	Indianapolis, Ind	May 30, 1910	42:41.33
75 miles	Marmon	Ray Harroun	Atlanta, Ga	Nov. 11, 1909	1:07:31.07
100 miles	Marmon	Ray Harroun	Atlanta, Ga	Nov. 11, 1909	1:30:08.31
Speedway—Class B—231-450 Inches.					
5 miles	National	William Kincaid	Indianapolis, Ind	May 27, 1910	4:05.76
10 miles	National	John Aitken	Indianapolis, Ind	July 2, 1910	7:55.12
15 miles	National	John Aitken	Indianapolis, Ind	July 1, 1910	11:48.78
20 miles	Marmon	Joseph Dawson	Indianapolis, Ind	May 27, 1910	15:57.63
50 miles	Marmon	Joseph Dawson	Atlanta, Ga	Nov. 3, 1910	39:47.35
75 miles	Marmon	Joseph Dawson	Indianapolis, Ind	May 27, 1910	1:00:16.34
100 miles	National	William Kincaid	Indianapolis, Ind	May 27, 1910	1:23:48.11
150 miles	Buick	Louis Chevrolet	Atlanta, Ga	Nov. 9, 1909	2:05:02.17
200 miles	Buick	Louis Chevrolet	Atlanta, Ga	Nov. 9, 1909	2:46:48.47
250 miles	Buick	Robert Burman	Indianapolis, Ind	Aug. 19, 1909	4:38:57.40
Speedway—Class B—451-600 Inches.					
5 miles	Knox	Barney Oldfield	Indianapolis, Ind	May 30, 1909	4:01.36
10 miles	Fiat	George Robertson	Atlanta, Ga	Nov. 11, 1909	7:47.71
20 miles	Fiat	Ralph De Palma	Atlanta, Ga	May 5, 1910	15:57.41
50 miles	Fiat	George Robertson	Atlanta, Ga	Nov. 13, 1909	42:02.98
100 miles	Fiat	George Robertson	Atlanta, Ga	Nov. 13, 1909	1:22:35.35
150 miles	Fiat	George Robertson	Atlanta, Ga	Nov. 13, 1909	2:05:00.63
200 miles	Rainier	Louis Disbrow	Atlanta, Ga	Nov. 13, 1909	2:53:48.32
Speedway—Class C—160 Inches and Under.					
5 miles	Flanders	Robert Evans	Indianapolis, Ind	Nov. 13, 1911	4:26.08
10 miles	Flanders	Robert Evans	Indianapolis, Ind	Nov. 13, 1911	8:53.97
15 miles	Flanders	Robert Evans	Indianapolis, Ind	Nov. 13, 1911	13:24.00
20 miles	Flanders	Robert Evans	Indianapolis, Ind	Nov. 13, 1911	17:54.82
Speedway—Class C—161-230 Inches.					
5 miles	Buick	Joseph Nikrent	Los Angeles, Cal	April 15, 1910	4:20.20
10 miles	Buick	Joseph Nikrent	Los Angeles, Cal	April 15, 1910	8:40.17
25 miles	Regal	——— Anthony	Los Angeles, Cal	Oct. 21, 1911	21:41.37
50 miles	Cole	William Endicott	Los Angeles, Cal	April 9, 1910	43:49.69
Speedway—Class C—231-300 Inches.					
5 miles	Marmon	Ray Harroun	Los Angeles, Cal	April 10, 1910	3:55.97
10 miles	Mercer	Harris Hanshue	Los Angeles, Cal	Oct. 21, 1911	7:47.20
25 miles	Schacht	William Jeffkins	Los Angeles, Cal	Oct. 22, 1911	19:48.97
50 miles	Dorris	William Siefert	Los Angeles, Cal	April 8, 1910	42:30.08
75 miles	Marmon	Ray Harroun	Los Angeles, Cal	April 8, 1910	1:03:54.28
100 miles	Marmon	Ray Harroun	Los Angeles, Cal	April 8, 1910	1:25:22.07
Speedway—Class C—301-450 Inches.					
5 miles	Buick	Joseph Nikrent	Los Angeles, Cal	April 17, 1910	3:49.36
10 miles	Buick	Joseph Nikrent	Los Angeles, Cal	April 17, 1910	7:36.61
25 miles	Marmon	Ray Harroun	Los Angeles, Cal	April 15, 1910	20:08.69
50 miles	Marmon	Ray Harroun	Los Angeles, Cal	April 15, 1910	39:53.55
Speedway—Class C 451-600 Inches.					
5 miles	Knox	Barney Oldfield	Los Angeles, Cal	April 16, 1910	3:38.61
10 miles	Knox	Barney Oldfield	Los Angeles, Cal	April 16, 1910	7:20.66
25 miles	Isotta	——— Marquis	Los Angeles, Cal	April 10, 1910	19:24.92
50 miles	Isotta	——— Marquis	Los Angeles, Cal	April 10, 1910	39:20.69
Straightaway—Free-for-All.					
1 kilo	Benz	Robert Burman	Daytona, Fla	April 25, 1911	0:15.88
1 mile	Benz	Robert Burman	Daytona, Fla	April 25, 1911	0:25.40
2 miles	Benz	Robert Burman	Daytona, Fla	April 25, 1911	0:51.28
5 miles	Darracq	Victor Hemery	Daytona, Fla	Jan. 24, 1906	2:34.00
10 miles	Benz	David Bruce-Brown	Daytona, Fla	March 24, 1909	5:14.40
15 miles	Fiat	——— Lancia	Daytona, Fla	Jan. 29, 1906	10:00.00
20 miles	Buick	Robert Burman	Jacksonville, Fla	March 30, 1911	13:11.92
50 miles	Buick	Robert Burman	Jacksonville, Fla	March 28, 1911	35:52.31
100 miles	Renault	——— Bernin	Daytona, Fla	March 6, 1908	1:12:45.20
150 miles	Pope	Louis Disbrow	Jacksonville, Fla	March 31, 1911	1:55:18.00
200 miles	Pope	Louis Disbrow	Jacksonville, Fla	March 31, 1911	2:34:12.00
250 miles	Pope	Louis Disbrow	Jacksonville, Fla	March 31, 1911	3:14:55.00
300 miles	Pope	Louis Disbrow	Jacksonville, Fla	March 31, 1911	3:53:33.50
Straightaway—Stock—161-230 Inches.					
5 miles	Warren	John Tower	Jacksonville, Fla	March 29, 1911	4:24.13
10 miles	Warren	John Tower	Jacksonville, Fla	March 30, 1911	9:10.52
Straightaway—Stock—231-300 Inches.					
10 miles	Cole	——— Wilson	Jacksonville, Fla	March 29, 1911	8:16.35
Straightaway—Stock—301-450 Inches.					
1 kilo	National	Charles Merz	Jacksonville, Fla	March 29, 1911	0:26.75
1 mile	National	Howard Wilcox	Jacksonville, Fla	March 30, 1911	0:40.32
5 miles	National	Howard Wilcox	Jacksonville, Fla	March 30, 1911	3:56.82
10 miles	National	Charles Merz	Jacksonville, Fla	March 29, 1911	8:03.67

WHO'S WHO IN THE INDUSTRY.

R. P. HENDERSON.

R. P. Henderson, Vice President Henderson Motor Sales Company.

R. P. Henderson, vice president of the Henderson Motor Sales Company, Indianapolis, Ind., which concern is general distributor of Cole cars, is one of the executives whose identity has but recently been established with the automobile industry, although he was for a considerable period actively interested in the Henderson company before he decided to devote himself entirely to its service.

Mr. Henderson is a brother of C. P. Henderson, organizer of the company, and for five years was sales manager for the Parry Buggy Company of Indianapolis. He formed a very wide acquaintanceship throughout the country and has a broad knowledge of service conditions which is now especially valuable to him. The prospects for business development were such as to attract Mr. Henderson to become associated with his brother and since he joined the company he has devoted himself toward broadening the channels for the marketing of Cole cars with material success.

JOHN S. AND D. A. HARRINGTON, JR.

The firm of J. S. Harrington & Co., agent for the Everitt cars with salesrooms in Boston, Worcester and Providence, and distributor for the line in New England, is now disposing of what is regarded as the largest order for automobiles ever given by a New England firm. A reservation of 1000 four and six-cylinder machines was made by the Metzger Motor Car Company for Harrington & Co., after a visit to Detroit early last summer by John S. Harrington, head of the concern. Then followed plans for marketing this order.

John S. and Daniel A. Harrington, Jr., of the Firm of J. S. Harrington & Co., Distributor of Everitt Cars.

John S. Harrington is one of the oldest as well as one of the best known motorists in Worcester. It was in that city he first engaged in business and later on he established a branch at Providence. Then came the opening of the Boston salesrooms. Daniel A. Harrington, Jr., brother of John S., was first located at Providence as manager of that branch, but he now gives all of his time and attention to the Boston business. He is quite as well known as the executive of the company. The brothers are exceedingly enterprising and have been successful with all lines of machines they have marketed.

Incidentally Mrs. John S. Harrington is a driver of unusual skill and judgment and she has driven in contests on Dead Horse hill at Worcester, a course that is known to all motorists, making time that was decidedly favorable when compared with the records made by men in cars of similar capacity.

F. R. BUMP.

F. R. Bump, Assistant General Manager of the Hupp Corporation.

One of the veterans of the motor vehicle industry, who has been identified with it since its inception, and previous to that with the production and sale of the bicycle, is F. R. Bump, who has recently been made assistant general manager of the Hupp Corporation, Detroit, Mich., which organization builds the R. C. H. cars, the Hupp-Yeats electric vehicles and various components utilized in automobile construction. He has charge of the sales, advertising and publicity of the concern.

Mr. Bump retired as sales manager for the Universal Motor Truck Company, Detroit, Mich., to assume his present engagement. When he was graduated from Cornell University in 1896 he became assistant to the sales manager of the Waltham Manufacturing Company, Waltham, Mass., then producing Orient bicycles. He resigned to become general manager of the bicycle department of the Davis Sewing Machine Company, maker of Dayton bicycles, which position he held until 1904, when he went to the H. H. Franklin Manufacturing Company, Syracuse, N. Y., maker of Franklin cars, as general sales manager. He retired from this position in 1910 and after several car agency connections joined the Universal Motor Truck Company. He is one of the best known men in the industry and his experience has been especially varied and valuable.

ALBERT H. DOOLITTLE.

The value of thorough mechanical knowledge in publicity promotion is demonstrated by the success of Albert H. Doolittle, advertising manager of the Knox Automobile Company, Springfield, Mass., who has been connected with several of the largest firms in the industry. Mr. Doolittle was graduated from the

WHO'S WHO IN THE INDUSTRY.

engineering department of Cornell University in 1904 and in 1905 went to the engineering staff of the Pope Manufacturing Company, Hartford, Conn. The following year he entered the employ of the Electric Vehicle Company, Hartford, and there had experience in every mechanical department, and then took up contest driving and later was engaged in selling Columbia cars. He continued with the Columbia Motor Car Company when that succeeded the Electric Vehicle Company, and became assistant manager of the branch in New York, N. Y. Mr. Doolittle made a six months' motor tour of Europe in 1909, during which he travelled more than 7000 miles and visited many of the prominent motor car factories and carefully studied work and methods. In the course of his touring he drove an American car over 15 of the highest passes of the Alps. He entered the employ of the Knox Automobile Company at his return and after gaining a thorough knowledge of the Knox mechanical construction and having other experience he was appointed publicity writer and assistant advertising manager. He was made advertising manager later on and now directs the campaign that the Knox company is so actively promoting with decided success. Mr. Doolittle is very widely and favorably known to the industry and to a large number of motorists.

Albert H. Doolittle, Advertising Manager, the Knox Automobile Company.

William T. Kincaid, Manager Kincaid Oil Company, Providence, R. I.

Robert C. Hupp, Creator and Executive of the Enterprises Known as the Hupp Interests.

WILLIAM T. KINCAID.

With those who have been active in the promotion of the use of the automobile vehicle there is none better, and few as well, known as William T. Kincaid, president and manager of the Kincaid Oil Company, Providence, R. I. He has for years been engaged in the distribution of lubricants and during a considerable portion of the time directed and supervised the use of the products he sold by racing men and in racing machines. This work brought him in contact with every driver of prominence and his experience with differing forms of oils and greases under all conditions of severe service, and often hardest stress of track and road contest, has probably not been equalled by any other man. This has been exceedingly valuable to him in business and has given him prestige that is not often enjoyed by those even most active in the industry. He is recognized as an authority on racing subjects and managed the beach racing meet at Old Orchard, Me., last September, this being so successful that it is probable it will become an established fixture of the East. Genial and affable, with a friendship that is world-wide, and energetic and resourceful in business dealing, Mr. Kincaid is a prominent figure in motordom generally and in his own industry especially.

ROBERT C. HUPP.

As an example of what success may be accomplished by energy, confidence and the ability to convince others of the worth of a project is the business career of Robert C. Hupp of Detroit, Mich., who is executive of the group of enterprises known to the automobile industry as the Hupp interests. These include the Hupp Corporation, the Hupp-Yeats Company and the manufacture of components entering into the construction of a motor car. While he was identified with the motor vehicle industry for a considerable period it was not until 1908 that Mr. Hupp became known as a manufacturer, and in a comparatively short time his business connections have become extremely large and important.

Mr. Hupp has been exceedingly fortunate in his projects, this applying equally well to planning, organizing and executing, and he has selected his lines of endeavor with astute knowledge of the requirements of the people and the markets. It is seldom that so young a man as Mr. Hupp gains the confidence and support of men of large affairs and it is rare that one makes so uniform successes as he has. Every undertaking he has engaged in has been demonstrated to be well founded from every angle and it will be admitted that he has had to meet with exactly the same conditions as have others who have not succeeded.

Mr. Hupp has been ambitious in his plans and while it may be said that he has accomplished much more in a comparatively brief period than many have in a life time, it is maintained for him that he has but little more than entered upon the threshold of his ambitions. With confidence in himself born of experience and inspiring the material support of others because of his successes, it would appear that Mr. Hupp's prospects are unusually brilliant.

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SEASONABLE STOCKS.

With practically every dealer in motoring accessories and supplies a portion of the stock carried consists of articles or goods that are in demand with reference to the seasons, a condition which calls for the exercise of more than ordinary care in buying. The enterprising man assumes that it is necessary to have whatever is desired, a very wise conclusion were it not for the fact that capital is often limited and to meet every requirement would necessitate investment that would materially lessen profits and often result in loss if one were to await demand. It is possible to obtain whatever is sought, with rare exceptions, in comparatively brief time and it is much better to do business by special order and quick delivery, insuring absolutely new goods, than it is to take chances with a stock for which there is a limited and uncertain sale.

DEMONSTRATING THE SPECIALTY.

Every business man has brought to his attention frequently articles that may be a necessity or a convenience, the value of which may not always be apparent to those who give but casual attention. This is especially noticeable with motor vehicle accessories. Whatever is offered for sale ought to be understood by those selling it, and when anything new is placed in the market the duty of the salesman distributing it, and those buying and selling it, is to learn the qualities claimed by the manufacturer with a view of demonstration to all who may be interested. Interest may often be created by a suggestion, a brief statement of fact, and by an illustration of the possibilities the foundation of considerable business may be established. The results are always dependent upon the knowledge of the salesman and his ability to convince the customer.

NEED OF PRECISE INFORMATION.

Any manufacturer of an article that is intended to be adapted to general use ought to make perfectly clear to the distributors, by information that may be filed, or by full note in catalogue, the conditions necessary for installation, or where installation may be made without change or special fitting. This is essential that the prospective purchasers may learn any fact that may be necessary. The general tendency is to deal with generalities in advertising matter or in catalogues, which causes confusion and often no end of trouble for the salesmen. In marketing a product of the class referred to it would be well to supply every detail and not leave anything to assumption or to the assumed intelligence of the purchaser.

SELLING THE AUTOMOBILE.

No rule can be established for the salesman who is displaying the motor car to a customer, for each person's requirements may differ with another, but it is certain enough that the seller's knowledge of the machine ought to be such that he can discuss mechanics with the mechanic, tell the same story in non-technical language to those who are not mechanically versed, and illustrate arguments with logical statements that do not make comparisons with other machines. The man who invites competition with what he has to sell will probably inspire confidence, while he who avoids contrast with others does not improve his case. He may bring about just what he seeks to escape by exaggeration or ridiculous comment, and should these be repeated and resented a business warfare may be precipitated that cannot result in good and may be much regretted.

BENEFITS FROM THE SHOWS.

Much that will benefit the man who conducts a garage or manages a store can be gained by visiting one or more good exhibitions. The larger and the more complete the better the results, if one is disposed to make the occasion one of business rather than pleasure. The garage manager can devote himself to perfecting his knowledge of cars in general, and of some special machines he may not be perfectly familiar with, because it is desirable to know of the changes made in construction that work on such machines may be intelligently directed. If cars are sold there is need of learning of all makes that are in the same classifications, while so much time as may be desired may be given over to the accessories. Incidentally the manufacturers and their representatives may learn much from careful and systematic visits to the exhibits, while those engaged in designing and construction can profit materially by examination of the displays.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

HACKSAW ATTACHMENT FOR LATHES.

The lathe is a useful article of equipment in the small motor car repair shop or private garage and is practically a machine shop in itself, as all turning operations and many milling, grinding and boring jobs can be accomplished with its aid. The accompanying illustration, Fig. 1, shows a simple power hacksaw attachment that can be used in connection with this versatile machine tool, and its utility in the small shop where such a device does not form part of the regular equipment can be readily understood.

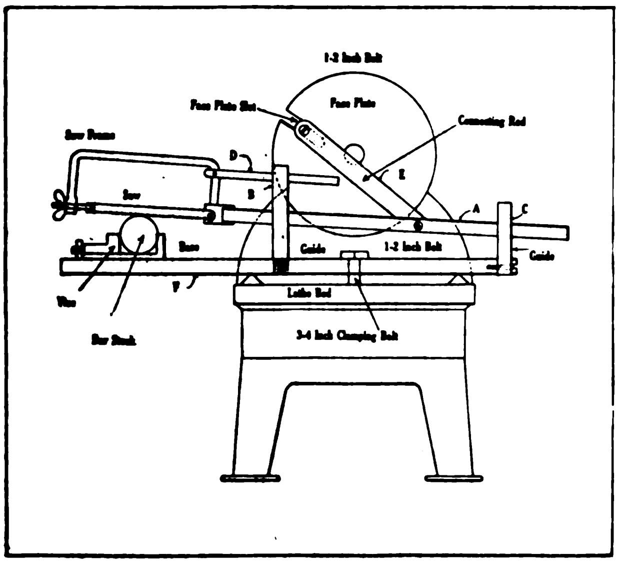

Fig. 1—Simple Power Hacksaw Attachment for Lathes.

The attachment consists of the slide bar A, to which the hacksaw frame is attached, and the guide bars or supports B and C that are firmly attached to the base piece F. The bar A is worked back and forth by a connecting rod E, that is adapted to be attached to the face plate of the lathe. The small bar D is a guide piece to keep the saw frame from turning.

The device is simple to build and the materials entering into its construction are not costly; in fact the design is such that it may be easily placed on or detached from the shears of the lathe. The base plate F is composed of a cast iron slab one inch thick, eight inches wide, and about five feet long. It is possible to form the guide members B and C integral when the slab is cast if they are placed on the pattern. The slide is a flat piece of steel ⅝ inch thick and two inches wide, the length is about four feet, though this will vary according to the stroke.

A hole is drilled in the centre of the bar for a ½ inch bolt, which is to form the crankpin for the lower end of the connecting rod E. The supports B and C may be made of one inch square machinery steel. The support B has an end turned and threaded to suit a ¾ inch tapped hole made in the cast iron base F. The support C may be attached in a similar manner or bolted to the other end of the base as shown. Each support has a ⅝ inch slot cut through the centre, this being made just large enough to permit an easy sliding fit to exist between the slide bar and the sides of the guide members.

The smaller guide D is made of ⅝ inch by one inch machinery steel, one end being bolted or rivetted to the saw frame, allowing the other end to slide through the support B, thus eliminating any tendency of the saw frame to wabble. The connecting rod E is a strip of ⅝ steel about two inches wide and of a length to suit that of the saw frame, which obviously determines the permissible stroke. The connecting rod is drilled at both ends for ½ inch bolts, and is intended to be attached to the face plate of the lathe at the upper end and the slide bar A at the lower end. The upper end may be moved to some extent in the slot of the face plate, making it possible to vary the stroke within the limits allowed by the slot and the size of the attachment. The saw frame is forged of machinery steel and the blade is made tight in the usual manner, by a thumb screw at the outer end of the frame. An ordinary drill or shaper vise is clamped to the base plate, this to hold the stock that is to be cut off. The attachment is bolted to the shears of the lathe by a clamping bar under them, which is pressed into engagement by a ¾ inch bolt as depicted.

VALVE TIMING.

In engines having the valves on opposite sides and fitted with a double ignition system, the spark plugs for the emergency ignition group are often placed on the exhaust side. It is sometimes found that the emergency system will not fire the motor regularly nor is the engine so powerful as when the magneto current, operating through the spark plugs over the inlet valves is employed. It is generally found that better results can be obtained from the spare ignition plugs if the hole through the valve cap in which the plug is screwed is enlarged. If the sparking plug points are set in a deep pocket, such as shown at Fig. 2 A, the hot exhaust gases are confined close to them, and may cause carbon deposits on the insulator or between the points that will make the plug inoperative. When the hole is enlarged as shown at B, there is more room for the gases which are not concentrated against the spark plug points.

The failure to start the engine on the switch sometimes experienced with a spare coil ignition system is very often due to the same condition, for there is practically no compression when the engine is at rest and the mixture will not approach the sparking points sufficiently to become ignited if they are enclosed in a pocket as at A. This applies to both sides of the motor. When the plug points are closely adjacent to

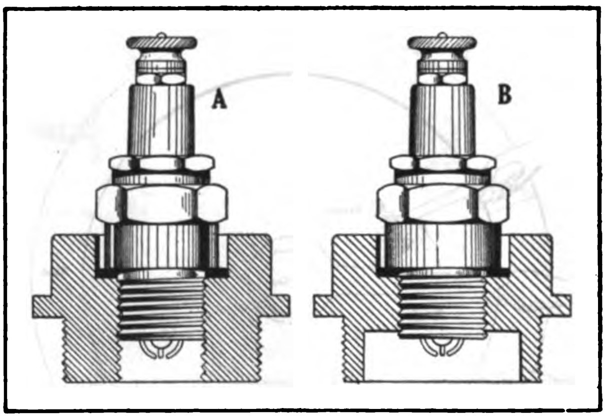

Fig. 2—Proper Method of Installing Spark Plugs in Valve Caps.

the combustion space, the explosion tends to burn away any deposit that may have formed on them, if over the exhaust, while they are more easily reached by the incoming fresh charge of gas if the inlet valve cap is cupped out as indicated at B.

LEFT HAND THREAD CUTTING.

Occasionally the repair man is called upon to cut left hand threads on brake, radius and other rods. This may be accomplished without the aid of a screw cutting machine or left handed dies. At Fig. 3 is shown a method of utilizing a right handed tap for this purpose, one of the desired number of threads being run into a nut until a snug fit is secured. The tool is then removed and a V slot cut of such a depth that when it is replaced, one cutting edge will be just above the bottom of the groove. It is then turned upside down after being inserted in this holder and with a piece of copper placed in the vise as shown. The soft metal is essential as otherwise the thread may be spoiled by pressure in the operation. The rod to be cut is then placed as outlined and turned to the left.

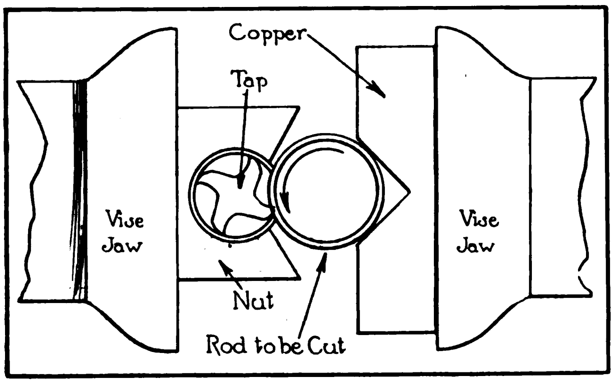

Fig. 3—Cutting a Left Hand Thread with a Right Hand Tap.

REMOVING STUBBORN HUB CAPS.

In inspecting the bearings of motor car wheels, or removing them from the axles it is necessary to remove the hub caps and while special wrenches are provided for this purpose by most manufacturers, and included in the tool equipment, the caps are sometimes very hard to displace. There are a number of conditions that cause this. On some types of floating axles the hub caps are depended upon to keep the driving shaft clutches in contact with the hubs, and as there is some strain and the caps are liable to loosen, a fine thread is used and the cap is set up very tightly when first assembled. Then again, paint sometimes gets in the threads, and when careless assembling methods prevail, the hub caps are often forced on over a rusty or wet thread, and thus become tightly bound. When bronze caps are used, they are not so liable to stick because of rust, but pressed steel members are very likely to "freeze" in place because of rust deposits in the threads.

While the wrenches provided have ample leverage, it is sometimes difficult to free the hub cap sufficiently to start it from the position where it has set. In watching workmen remove these caps, the writer has found that various methods were the vogue, some of which could be commended, and others which were not so desirable. A very common process is to employ a heavy hammer as shown at Fig. 4 A, the operator holding and bearing down upon the end of the wrench with one hand and striking it at a point near the end with the hammer as indicated. If the hub cap is not too tightly rusted, it will be loosened by the hammer blow, which has a tendency to break the film or layer of rust holding the hub and cap together.

The hammer, however, is not a tool that is highly esteemed by the thorough mechanic, except for its legitimate uses and as the wrench is mutilated, and the operator is liable to injure his hand if the hammer should slip, the experienced man believes that there are methods better suited from a viewpoint of mechanical fitness. A simple process is shown at Fig. 4 B, this involving the use of an ordinary lifting jack. The wheel, if a rear one, is firmly locked by a brake, if a front one by suitable blocking to prevent it turning, and the wrench is applied as indicated. The jack is placed under the free end, and as a pressure of tons can be brought to bear upon the hub cap in this manner, it is seldom that one cannot start the most stubborn member by this method.

The last resource of the mechanic when other means fail is to heat the hub cap thoroughly with a gasoline torch, taking care not to blister the paint of the wheel, and after it has been heated to some extent, and presumably expanded, to see if one can inject some kerosene between the threads with an oil can or syringe. With a lead or copper hammer, the hub cap is carefully tapped all around to break the rust bond, and if the wrench is applied before the hub cap has a chance to cool too much, it should not be hard to remove it. It is often preferable to blister a little paint than be forced to remove a specially stubborn fitting with a cold chisel and hammer.

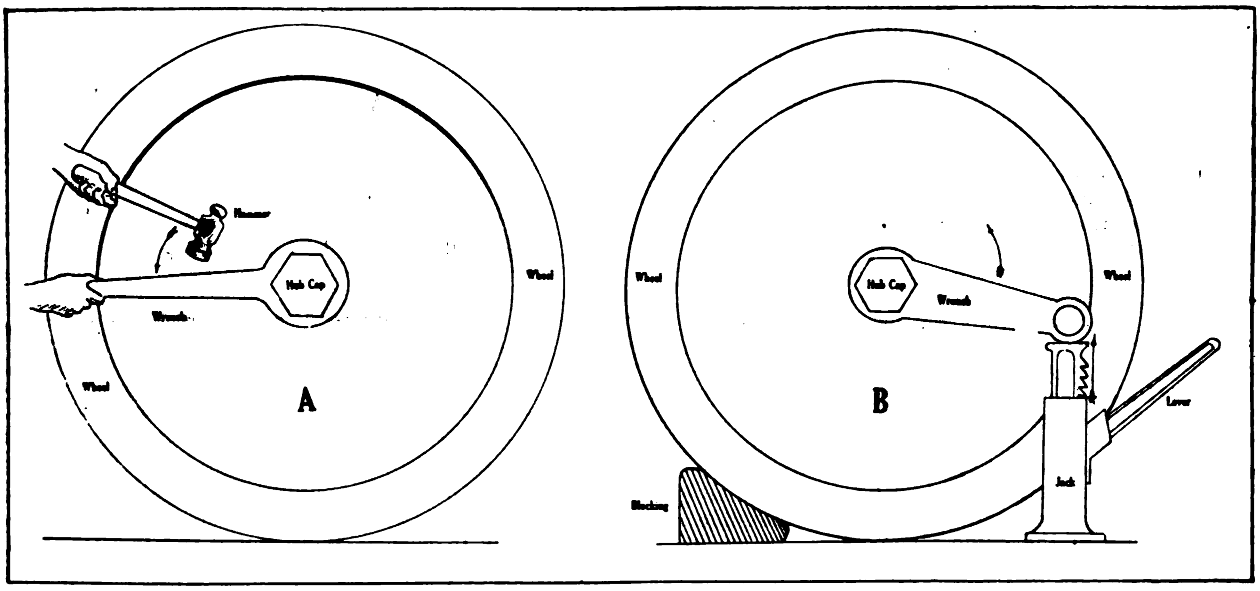

Fig. 4—Outlining Several Methods of Removing Hub Caps That Have Become Rusted in Place.

HINTS ON USING MICROMETER.

The correct setting and reading of the micrometer is little understood by many workmen. Callipers should not be employed when accurate measurements are to be made, as these cannot be obtained with this instrument. The first named is a valuable asset in the shop. It should be handled tenderly and not subjected to rough usage, for unless cared for it will soon cease to be a tool of precision.

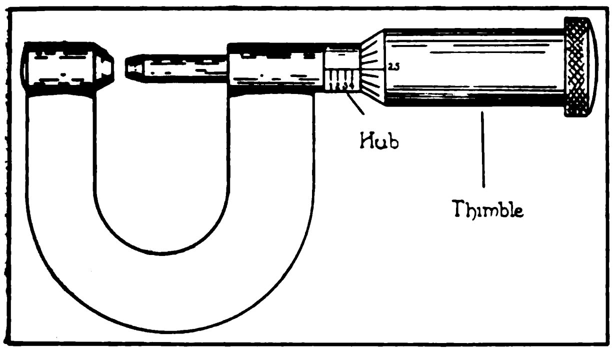

Fig. 5—Outlining Use of Micrometer.

When turning a spindle, if it is desired to measure the diameter, the micrometer should not be forced over, but the screw should be eased back, thus bringing the contact points clear of the metal. By turning screw until the points just touch the object, the measurements can be read off easily. It should never be used to measure a member while in motion.

Some are fitted with a ratchet stop, so arranged that when the points of the tool come in contact with the shaft it is brought in operation, thus preventing any undue pressure. This also is very convenient when a number of measurements are to be taken, as it enables the same degree of pressure to be applied to all the articles.

In using the micrometer, it is essential to have decimal equivalents of parts of an inch. Most instruments have these stamped on the surface, but as the figures are very small, it is advisable to hang a table on the wall or procure a copy of pocket size. One was published by The Automobile Journal in the issue of May 13.

At Fig. 5 is shown a micrometer, the working of which can be grasped easily. The pitch of the screw is 40 to the inch, as is the graduation of the hub, and the latter is marked 1, 2, 3, 4, etc., every fourth division. As the graduation of the hub conforms to the pitch of the screw, each division equals the longitudinal distance traversed by the latter in one complete revolution, which opens the micrometer one-fortieth or .025 inch.

The beveled edge of the thimble is graduated into 25 parts, and figured 0, 5, 10, 15, etc. Each, when passing the line of graduation on the hub, indicates that the screw has made one twenty-fifth of a turn, and that the opening of the gauge has increased one-twenty-fifth of one-fortieth, or .001 of an inch.

To read the instrument: The number of divisions visible on the scale of the hub should be multiplied by 25, and to the product should be added the number of divisions on the scale of the thimble from zero to the line coinciding with that of graduation on the hub. For example, the number of divisions seen on the scale of the hub in the sketch is four. By multiplying this by 25 we have 4x25=100.

It will be noticed also that the division number on the scale of the thimble coincident with the line of graduation on the hub is 25. Adding this to the above we get 125. A decimal point is placed in front of this number making it .125. This is expressed as a fraction of an inch that equals one-eighth, as shown by a table of decimal equivalents, and gives the amount by which the gauge is opened.

HOMEMADE BREAST DRILL LATHE.

In drilling holes .015625 or .03125 inch in diameter, the small actual cross section of the twist drill makes it an easy matter to snap it. Then again it is difficult for the amateur repairman to drill the hole accurately as he is apt to make the opening larger than the actual diameter of the drill. In Fig. 6 is shown a design of a homemade breast drill lathe which is capable of doing light work such as drilling, polishing, refacing valves, turning keys to size and numerous other light jobs. The cost of making the device is small and the average motorist can make one.

In Fig. 6 A is shown the breast drill clamped in a vise. By the aid of a spirit level, with which many drills are equipped, a perfectly horizontal position is secured assuring accurate work in drilling. To make the tailshaft member a block of wood, hard is preferable, and a strip of sheet iron .1875 is necessary. The block should be of inch stock, six inches long and

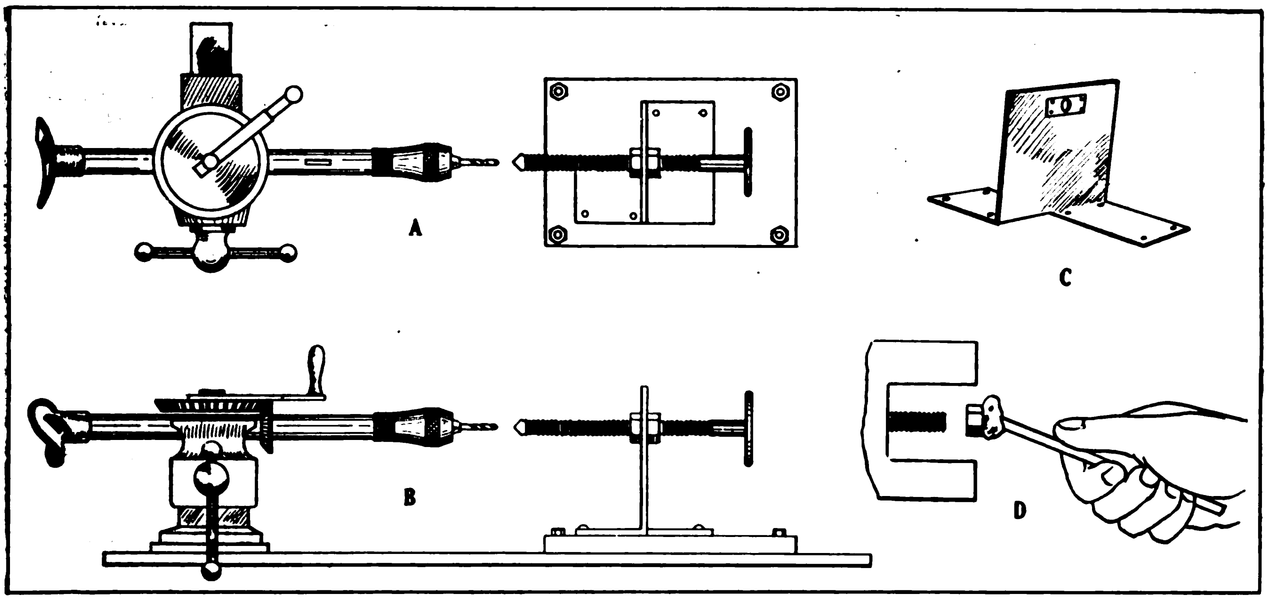

Fig. 6—Method of Converting Breast Drill Into Lathe: A, Lining Up the Drill with Tailshaft; B, Correct Position of Drill in Vise; C, Device for Holding Tailshaft; D, How to Replace Nut on Thread in a Small Aperture.

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four inches wide. Assuming that from the centre of the chuck of the drill to the top of work bench is 5.5 inches it will be necessary to use a strip of sheet iron at least eight inches long by four inches wide.

A piece of iron or soft steel, two inches long, one inch wide and .25 inch thick, is rivetted to the strip of iron as shown in Fig. 6 C. This plate should be attached so that its centre is 5.5 inches from the top of the bench in order that the tailshaft will line up with the centre of the chuck. Holes, .25 inch in diameter, are bored in the metal strip for the purpose of fastening it to wooden block, as is shown in Fig. 6 C. The metal is then cut and bent to shape.

In making the cut due allowance must be made for the block, which is one inch, and to the centre of the rivetted plate, which is 4.5 inches less .1875 inch, the thickness of the sheet iron. A small variation can be offset when placing breast drill in lathe. The centre of the rivetted plate is prick punched, drilled and tapped for .5-inch thread. By using a spirit level a true vertical position can be secured when fastening the device to the block. Four holes, .4375 inch, are bored as shown in Fig. 6 A, for the purpose of bolting tailshaft member to work bench.

The tailshaft is made of .5-inch round stock about six inches in length. One end is pointed while at the other is fastened a small hand wheel which can be pinned to the shaft. The tailshaft is threaded and can be locked by a nut on either side when using the lathe for turning purposes, as shown in Fig. 6 B. Four holes are now bored through the iron and block to take .375 inch in diameter bolts which are used to fasten the device to the workbench.

Allowance must be made for operating the tailshaft when boring holes to fasten the block to the workbench. The bolts should be long enough to permit of the use of nuts and washers. The device can be fastened either at the right or left hand of the vise, according to convenience. When not in use it can be easily removed.

REPAIRING EXPANDING TYPE BRAKES.

When cars are fitted with the expanding type of brake considerable wear takes place where the cam bears. This is true especially where the machine has but one set. Taken in connection with the wear of the lining material this prevents the surfaces from gripping as they should.

The parts may be repaired easily and at a very slight expense. At Fig. 7 A is depicted a method of rebuilding the face of each contact point. The ends are first trued up and steel plates cut to fit. Two holes are then drilled and countersunk so that the heads of the binding screws will not be worn. The apertures are next capped and fastened securely by screws. These should be well below the bearing surface of the plates.

Another method is outlined at C. Here, cap screws are utilized. Holes are drilled and tapped to take the members which are held by a lock nut. This repair also is made easily and has the advantage of being adjustable.

BEVELS SHOULD BE ADJUSTED.

Bevel driving gears should be meshed and lubricated properly else they will be noisy and the parts worn unnecessarily. In addition, power is wasted. Almost any pair will run with a near approach to silence if correctly adjusted and oiled. In modern axles it is possible to reset these members and eliminate the grinding noise.

HANDY DRIVING SPANNER.

An English concern has brought out a new form of driving spanner which is shown at Fig. 7 B. Frequently it is difficult to start a nut which is tight either by reason of its natural fit or through being placed in a position that is inaccessible. The usual method is to employ the cold chisel and hammer. This is bad practise, however, and should not be resorted to until other means have failed. The operation of the device is obvious. It is placed over the refractory member and a punch and hammer utilized. These spanners are made in different sizes and will start nuts which refuse to yield with the ordinary box set wrench.

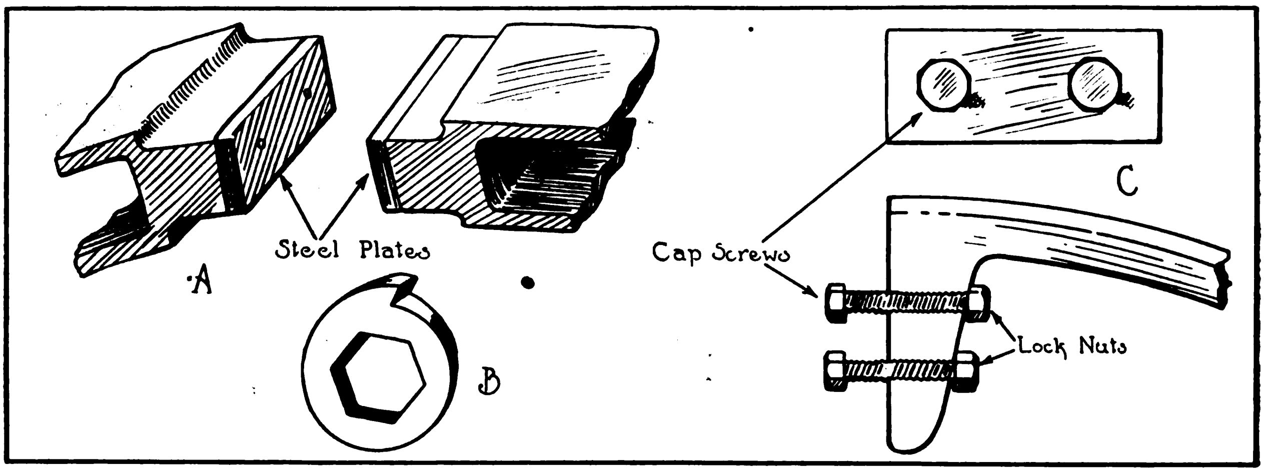


Fig. 7—Some Shop Repair Hints: A, Repair of Worn Brakes of Expanding Type; B, a Handy Spanner for Starting Stubborn and Inaccessible Nuts; C, Another Method of Restoring Worn Brake Surfaces.

PROPER TIMING OF THE VALVES.

To obtain the greatest efficiency from an internal combustion motor it is essential that the valve and ignition timing should be correct. The average motorist hesitates to attempt the correction of improper operation in either, and although absolutely proper timing of valves is a delicate task, requiring as it does an expert, considerable improvement may be effected by the novice.

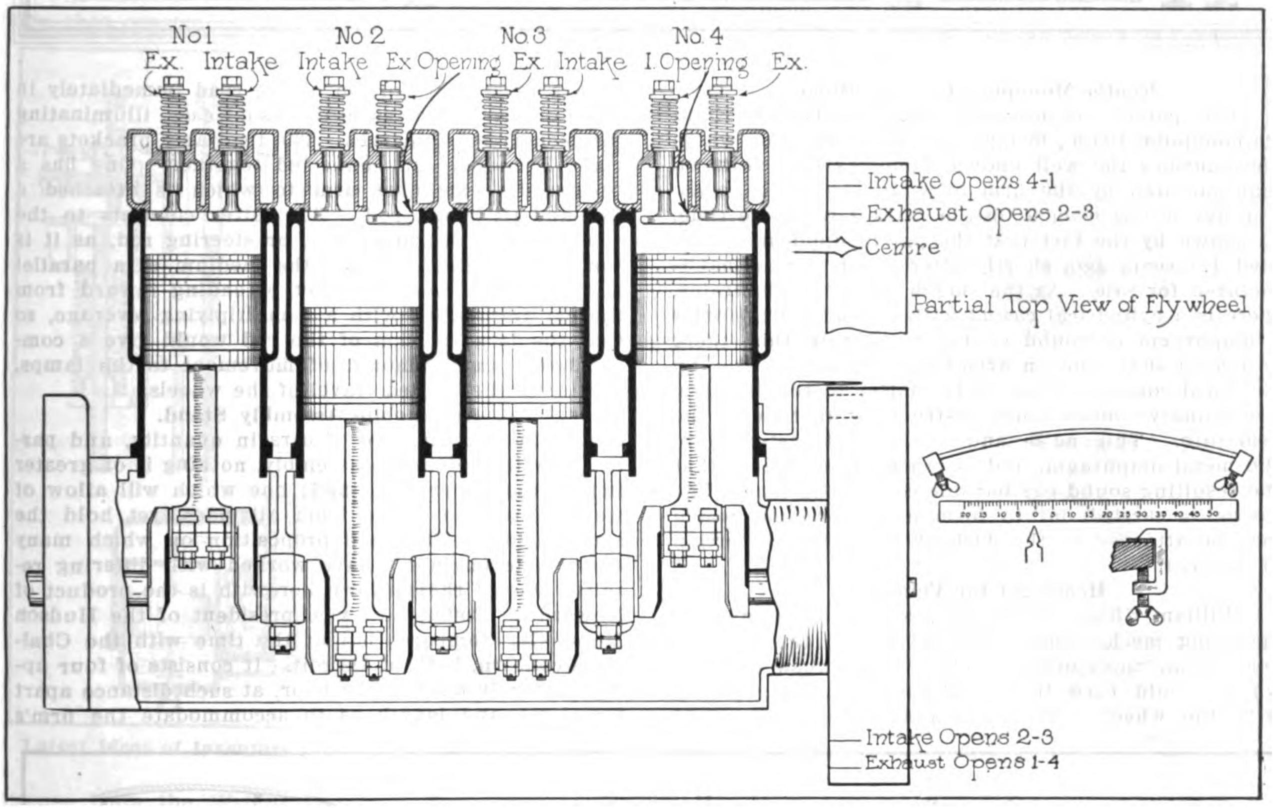
Generally speaking, not much can go wrong with the engine to put the valves out of time. Usually wear in a number of places such as cams, tappet rods, plungers, etc., will bring about a loss in power. The constant hammering of the tappet against the end of the valve stem sometimes results in this being flattened out causing a valve to open too late and close too early, or not lift high enough, and thus retard the flow of gas to the cylinder. Excessive wear of the gear teeth on the crank and camshaft, or if either be loose, will affect the operation of the cams and consequently the timing. With the large gears, such as are now utilized in motor car construction, the amount of wear taking place would not make any great difference.

Markings on Flywheel.

The correct opening and closing of valves is marked on the flywheel by the majority of manufacturers. These figures puzzle the novice, but are easily understood if the motor's cycle of operations be taken into consideration. The figures, 1, 2, 3, 4, represent the cylinders while the letter I means the intake valve and E designates the exhaust. Thus, the marking I. O., 2, 3, signifies the intake valves of the second and third cylinders open. Another set is I. C., 2, 4, which denotes the time the intakes close. When the letter C is used alone it indicates centre.

The explosions of a four-cylinder motor do not take place in order; that is, the arrangement of the crankshaft is such that two pistons are up and two down at the same time as will be noted in sketch. In this instance the first cylinder is about to be ignited by the spark while the fourth is about to take in a charge of gas. The pistons in the second and third cylinders are nearly at the bottom of the stroke and these are exhausting and compressing respectively.

The order of the firing is 1, 3, 4, 2, and it will be seen that the first to explode is No. 1, the next No. 3 and the last is the second cylinder. This order may be 1, 2, 4, 3, according to the design of the engine. In either case there are four strokes of the piston and two revolutions of the crankshaft to bring about one impulse or firing stroke. By referring to the firing order below the illustration it will be noted the sequence of the strokes is: Firing, exhaust, compression and suction of cylinders 1, 2, 3, and 4, respectively. By utilizing these tables one may become familiar with the order of explosions and these figures may be employed in timing where the flywheel is not marked.



How Valves Are Timed and Tappets Adjusted by Utilising the Markings on the Flywheel.

FIRING ORDER 1-2-4-3.

Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
1—Firing	Compression	Exhaust	Suction
2—Exhaust	Firing	Suction	Compression
3—Suction	Exhaust	Compression	Firing
4—Compression	Suction	Firing	Exhaust

FIRING ORDER 1-3-4-2.

Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
1—Firing	Exhaust	Compression	Suction
2—Exhaust	Suction	Firing	Compression
3—Suction	Compression	Exhaust	Firing
4—Compression	Firing	Suction	Exhaust

Checking Valve Action.

Where wear has taken place at the tappet or valve stem, and these members are adjustable, the efficiency of the motor can be improved greatly by resetting to conform with the figures previously referred to on the flywheel. The usual method is to lengthen the tappet until an ordinary cardboard may be inserted and while this is commendable a better way is to check up the lift of the valves, and this operation is not a difficult matter.

As has been explained the crankshaft makes half a revolution to each stroke. Referring again to the drawing it will be seen that the first cylinder is about to fire and that both valves are closed. The exhaust of the second is about to open. If the timing be correct, the indicating arrow, as shown, will point to the marking E. O., 2, 3. If late these figures will pass by the indicator and the exhaust tappet of the second cylinder should be adjusted until the valve starts to open on the line. Moving the wheel slightly the marks I. O., 4, 1 will appear as the intake valve of the fourth cylinder should start to lift and if it does not, this should be adjusted. The flywheel is now given nearly a half turn when the markings for the exhaust members, 1 and 4, and intake 2 and 3, will appear and can be regulated.

Some makers include the closings on the flywheels and these also can be checked, but many simply mark the openings as too many figures are apt to confuse the amateur. It is not a good plan to attempt improving the setting of the valves as marked by the manufacturer for the motors are thoroughly tested and valves timed to give the best results by the designers.

Timing from Crankshaft.

Where the flywheel is not marked the timing will have to be secured from the factory, but a gauge that will prove useful in timing the valves from the crankshaft is shown in sketch. The device consists of a piece of brass about .0625 inch thick by one wide. As the diameter of the average flywheel is approximately 15 inches, a foot of metal will be sufficient. The fraction of an inch that equals a degree on the flywheel is figured out and marked on the brass. The degree can be ascertained by calculating on the basis of 360 degrees to a circle.

In using the instrument the top and bottom centre of the flywheel are located. This may be accomplished by inserting a rod through the opening in the compression cock or by removing the crankcase to ascertain when a piston is at the bottom and top of its stroke. The rule is then laid upon the flywheel with the zero mark under the usual pointer that is affixed to the motor. The points are then marked off or compared. The device can be fastened to the flywheel by clamps as indicated in the illustration.

All timing should be done when the motor is hot in order to secure the best results. The relief cocks should be opened to reduce compression so that the flywheel may be rotated easily. If the motor be not equipped with these devices the spark plugs may be removed. The adjustment of the valve openings is a simple matter and the operation will be facilitated by studying the accompanying illustration, which was so drawn as to make clear the valve openings and their markings on the flywheel.

RECENT PATENTS of INTEREST

Kent's Monoplex Electric Horn.

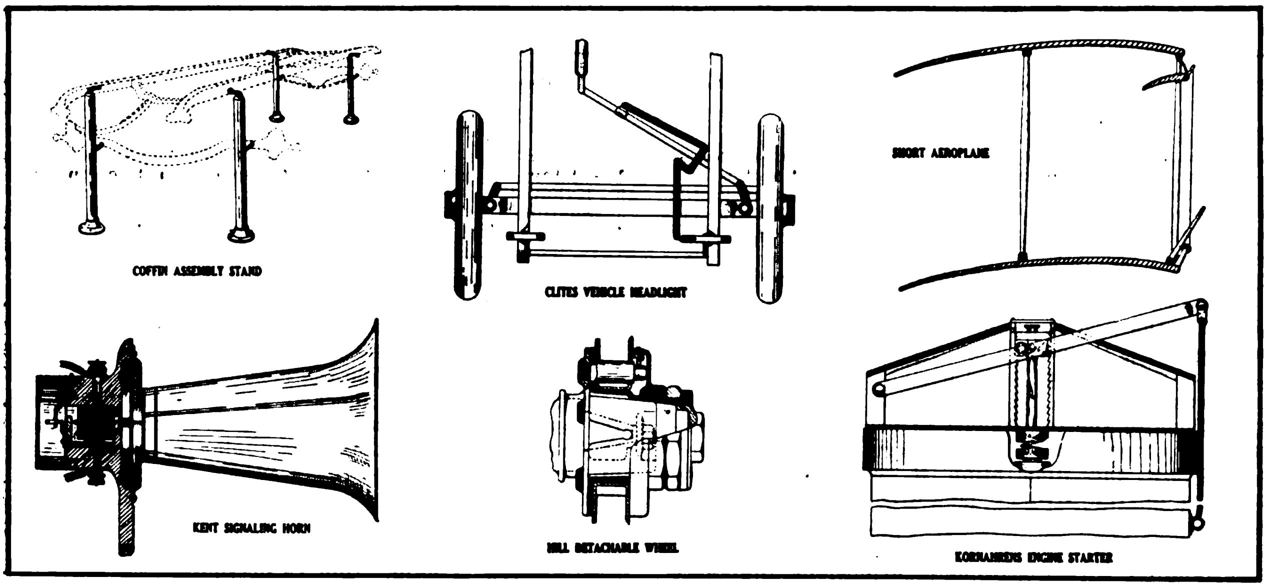
The patent recently granted A. Atwater Kent, Philadelphia, Penn., brings out the combination which distinguishes the well known Monoplex electric horn, manufactured by the firm of which he is the head. The device has been upon the market for some time, as shown by the fact that the patent application was filed 1.5 years ago, shortly after which it was manufactured for sale. As the sketch herewith illustrates, there is a cylindrical casing with an end which forms a diaphragm or sound chamber. Within this, there is a fixed shaft and an armature mounted on it. An electrical connection causes the latter to rotate, when a stationary contact point is struck by another on the armature. This noise and action is transferred to the metal diaphragm, and is repeated so rapidly that the resulting sound has but one continuous tone. The casing is carried out to form a flat bracket, which may be attached to the dash or other handy portion of the car.

Headlight for Vehicles.

William Clites, Elliott, Ia., has just patented an operating mechanism for connection to the steering gear of an automobile, truck or other road machine which would turn the headlights mounted upon it with the wheels. In this manner, the light would always cover that portion of the road immediately in front of driver, not as is the usual case, illuminating the scenery on all curves. The two lamp brackets are made swivelled and connected together. One has a backwardly extending arm to which is attached a fore-and-aft reach rod. The latter connects to the steering gear operating rod, or steering rod, as it is sometimes called, through the medium of a parallel motion. This has a bracket extending inward from the car framework with a demultiplying leverage, so that the large motion of the rod would give a comparatively small amount of movement to the lamps, similar to the limited travel of the wheels.

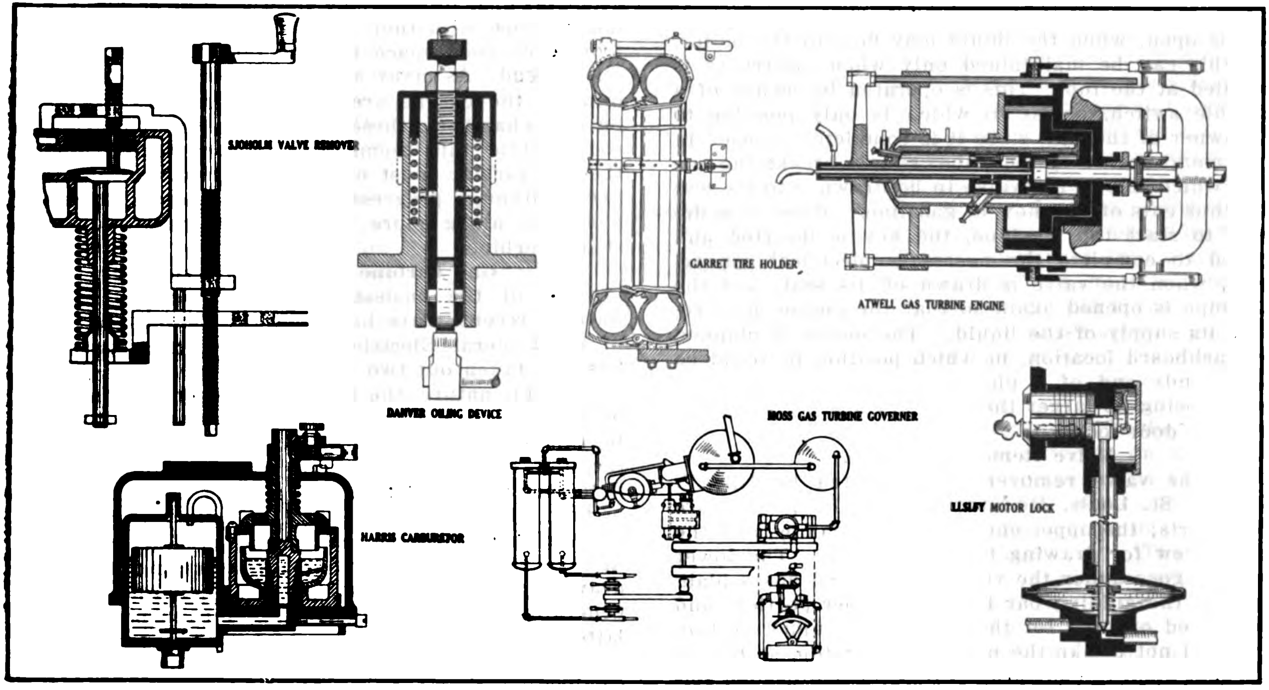
Automobile Assembly Stand.

In the manufacture of cars in quantity, and particularly in the chassis assembly, nothing is of greater import than a proper stand; one which will allow of working on the frame from all sides, yet hold the same rigidly. This is a proposition on which many automobile engineers have worked with differing results. One of these shown herewith is the product of Howard E. Coffin, now vice president of the Hudson Motor Car Company, but at the time with the Chalmers concern, both of Detroit. It consists of four uprights, firmly fixed to the floor, at such distance apart for width and length as to accommodate the firm's



Ideas Which Have Emanated from Automobile Engineers and Inventors During a Portion of the Past Year, Including Self-Starters, Headlight Controllers, Detachable Wheels, Aeroplane Details, Electric Horns, and Assembling Stands.

standard chassis frame. The top carries a swivel end, which is flattened in a vertical direction with a hole for a horizontal bolt. Moreover, its height in the support is variable at will, but may be fixed at any predetermined distance. The combination patent calls for a projection on each post, the length of which would fix automatically the position of the axle; the front for one pair and the rear on the other. As drawn, the two forward swivel ends are turned inward from the supports, while the rear ones are turned outward. This feature allows of placing the uprights inside or outside as is most desirable considering the chassis to be worked upon. The idea is susceptible to further amplification, in that the lower lugs on the posts might be made adjustable and marked, so as to permit of changing wheelbases by a few inches by a simple alteration of the adjustment. This would be handy for many firms which manufacture touring cars and runabouts with identical parts but a shorter wheelbase and more inclined steering post.



Latest Ideas of Inventors Working on Automobile Parts, Accessories or Appliances, Including Two Gas Turbine Patents.

Aeroplane Construction Details.

The Short Bros. of England, the well known concern that constructs the Short-Wright biplane, under license from the Wright Company, Dayton, O., has produced a combination of ailerons with the two main planes on which it has been granted an American patent. This includes a small, comparatively narrow surface set directly under the leading edge of the upper plant, and pivoted in such a manner that they may be turned to offer a little wind resistance to forward progress or much as desired by the pilot. The idea of the small surfaces is to deflect the air currents to or from the forward portion of the main aerofoils as desired. With this, a lever at the lower plane regulates the movement of the ailerons. By varying the lengths of these and their controls, it would be possible to render the half of any portion of the upper plane temporarily inefficient insofar as its lifting power were concerned, thus controlling the vertical and turning movements. This appears to be the Short idea, judging from the various claims.

Detachable Form of Wheel.

Many men have worked on the detachable wheel; that is, the form which is removable as a unit, but more attention has been paid to this matter in England than in this country. An Englishman, Barton B. Hill, Stoke Newington, London, recently has taken out a patent on a new form. This is built with a shell-like hub with a number of pins, the flange having a series of holes to receive the same. The wheel portion also carries a locking device, which rotates with it and grips all of the pins in such manner as to unite the hub with its spokes, felloe and tire to the flange and axle as firmly as if the two were built together. An external member is rotatable as soon as a locking nut has been loosened, and when this is the case, may be turned relative to the rest of the wheel, thus operating a cam member which loosens the lock, frees all pins, and thus allows the withdrawal of the wheel in toto.

Gasoline Engine Starter.

The idea of a spirally grooved shaft in which a pin engages is not new for starting purposes, but Henry L. Kornahrens, Oakland, Cal., has combined them in a novel manner to produce a good looking device. The usual starting shaft with its jaws to engage with duplicates on the crankshaft is prolonged forward for a considerable distance, this latter portion carrying the deep spiral groove. A long bar crosses the front of the frame, and is operated on the driving side of the car by a lever and rod connection which pulls it straight backward. At the middle, a downwardly projecting pin fits into the groove in the starting shaft. The former moves straight backward, hence the shaft must be forced first backward until the jaws engage, then turn, until the pin reaches the limit of its motion. As the hand leverage may be considerable, and that at the front bar is also, the driver has a big advantage over the usual 14 or 16-inch lever.

Garrett's Tire Holder.

With the great increase in carrying of extra tires, either inflated or without air, as well as on a rim, so as to be ready for use at a moment's notice, there has come a large demand for superior forms of holders. Without a proper retaining iron, it is impossible to carry the valuable accessories in a manner which will insure them correct care. A new design which has some valuable features has just been produced by Frank S. Garrett, Wilmington, Del., under patent 1,000,508. Three supports are provided, one of which may be set horizontally at the top, its purpose being to hold the tire or tires in their desired position. Two others are made in sections with a connecting strap, so as to retain them against the holders. On the folding parts, the faces are shaped to fit the tire, while the permanent top iron carries a pair of flat plates with a similar curvature.

Simplified Form of Carburetor.

In his new carburetor, the subject matter of patent 1,000,518, John Harris, Cleveland, O., has provided a complete and permanent standpipe for fuel in the form of a cup shaped bowl within the vaporizing portion of the device. This is connected with the float chamber through a passage, and is opened and closed by means of a rotating valve of the tapered plug type, carrying a registering slot. When this and a hole in the casing are in line, the fuel is free to flow up into the cup and form a deep puddle there, subsequent vaporization being of the surface order, that is, air passing over the surface of the puddle picks up its gasoline in that manner, as opposed to the more usual spraying method. The operation of this valve is by the hand throttle, but in moving it also picks up and carries along with it the disc which controls the size of mixture outlet.

Illsley Motor Lock.

In the lock on which F. P. Illsley has just been granted patent 1,000,523, and which he has assigned to the Sireno Company, New York City, an electric circuit is used to control the motion of a valve which opens or closes the fuel flow pipe. The normal position is open, when the liquid may flow to the motor, but this can be maintained only when electricity is supplied at the top. This is operated by means of a suitable switch, access to which is only possible to the owner of the key, since it is completely housed in by a metal case. This member simply breaks the circuit, which allows the valve to be drawn into its seat and thus cuts off the flow of gasoline. When it is desired to start the machine, the key is inserted and turned to complete the necessary electrical connections, when the valve is drawn off its seat, and the fuel pipe is opened again so that the engine may receive its supply of the liquid. The device is planned for dashboard location, in which position it would be both handy and of a pleasing appearance, the projection being no larger than the keyhole section of an ordinary door lock.

Valve Removing Device.

In the valve remover just invented by Nils P. Sjoholm, St. Louis, Mo., patent 1,000,559, there are three parts; the upper end and lower clamps, and the hand screw for drawing them together. The lower member goes under the valve spring, and has a plain hole for the guiding bar from the upper portion, and a threaded opening for the screw. The upper section is shaped not unlike the usual cylinder top, so that it is seated upon the surface, while a square headed setscrew projects down into the combustion chamber and rests upon the valve. This prevents the latter from rising, when pressure is applied to the under side of the valve spring. The operating part is a straight bar with two diameters at the bottom, both threaded. The smaller is right handed and fits into the lower member, while the larger is left and engages the top portion. The handle when turned pushes the first in one direction and the other, oppositely. The top bar and the extension arm of the lower are both made with a series of holes, spaced out from the utmost position so as to render the apparatus usable on large and small cylinders. In the sketch, it is shown near the limit of motion, as will be noted by the position of the valve key below it.

Pushrod Oiling Device.

This is a simple little device intended to make automobile engines operate with less noise and friction. To that end, the inventor, Andrew C. Danver, Providence, R. I., has incorporated in his apparatus, on which he has been granted patent 1,000,722, a hollow pushrod. This works in a bushing which has the form of a double annular ring. The central bolt is for the rod, while the outer opening contains a supply of lubricant. In this another annular ring shaped projection on the top of the pushrod works up and down, being restricted by the spring which is placed in this chamber. When it comes down, it acts as a plunger pump and forces oil through holes in the pushrod to the moving surfaces, which are thus quieted and rendered frictionless. On the upstroke, this becomes a suction member drawing in a fresh supply of lubricant from outside source. The upper end of the rod carries a third annular ring shaped part which fits around the outside of the guide and prevents leakage. The sketch herewith shows the construction more simply than it is possible to describe it.

Atwell Gas Turbine.

The gas turbine has long been the dream of inventors, for it would convert the explosive force of gasoline vapor or others immediately into rotary motion, instead of into reciprocating and then rotary, with the consequent losses, as in all other forms. A Baltimore man, Edwin Atwell, has just been granted a patent, 1,000,882, on a form which presents considerable novelty. This has a rotor with a plurality of radially disposed open ended spiral passages, a driving shaft connected with this and a long cylinder, which has a series of passages to register with those mentioned extended within the rotor. Inside of the cylinder, is a rod adapted to carry a number of separate pistons, forming the interior into as many cylinder heads, with their individual values. A passage from each such space runs to the main cylinder receiving end. As many spark plugs or other means of igniting the charge are provided as there are combustion chambers, these being timed with the piston rod. While this seems a very complicated device, the gas turbine must of a necessity be one of many parts, although progress abroad, notably in Germany, has been along more simple lines, parallel to the steam turbine.

Gas Turbine Governing Device.

One of the busiest workers along gas turbine lines in recent years has been Dr. Sanford A. Moss, of the General Electric Company, Lynn, Mass. He has just taken out two patents, 1,000,968 and 1,000,969 of this nature, the former of which is illustrated, while the latter refers to a regenerator to be used in this system. The governing method consists of the unit itself; a combustion chamber for supplying fluid and separated from the moving parts; a source of fuel, which discharges into the latter; a valve controlling this through a ratchet and pawl arrangement, and a speed-responsive device actuating it. The drawing shows the combination, including the regenerator previously referred to, the purpose of the latter being to utilize the heat of the exhaust for warming the mixture previous to its entry into the combustion chamber. In the system, there appears to be an air compressor driven by belt from the turbine shaft, which pumps into a receiver, the air thence passing through the regenerator, and to the combustion chamber, where oil is sprayed into it and the mixture compressed. The governor seems to work upon the oil passage, preventing the flow or allowing it to increase as the speed becomes too high or too low.

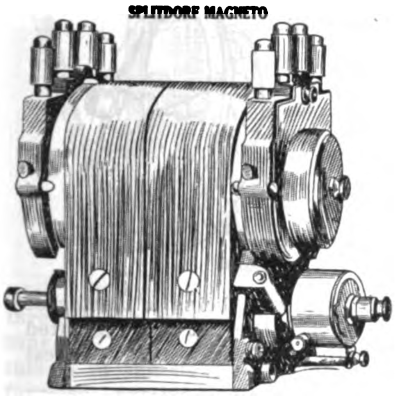
FEATURES OF VANADIUM.

"A great deal has been written and said about vanadium, its peculiar effect upon steel and its application in automobile construction," says M. J. Hammers, general manager of the Abbott Motor Company of Detroit. "Many prominent scientists and metallurgists concede that it acts largely as a scavenger and exercises a beneficial influence on almost all of the carbon and alloy steels, being introduced in very small quantities during the melting process. Its chief office seems to be that of removing the last traces of oxygen and oxides, as well as minute amounts of nitrogen. Vanadium aids the finished product, giving it closeness and fineness of grain, elasticity and toughness. In addition the steel is sufficiently soft in its annealed state to be turned and machined like low carbon steel."

ACCESSORIES AND APPLIANCES THAT SELL.

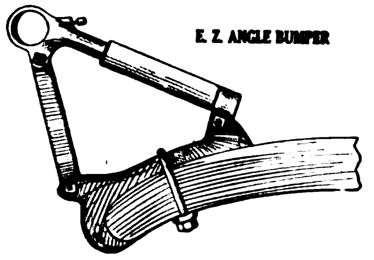
The Splitdorf Double Distributor Magneto has been developed to meet the large demand which has arisen during the past year for a stable method of producing two sparks simultaneously within the combustion chamber. When it was announced that this would add from 10 to 15 per cent. to the power developed by the engine, the first call for suitable instruments of this type came from owners and drivers of racing cars. That was followed shortly by similar action on the part of car owners and users, with no desire to race, but simply a wish for all the power the engine size could give. So great was the latter that C. F. Splitdorf, New York City, a prominent manufacturer of ignition apparatus, was obliged to bring out the instrument pictured herewith. This is equipped with a double distributor, the arrangement being such that the two sparks occur at exactly the same instant. Otherwise, it has much the appearance and size of the better known Splitdorf product. The weight is practically no greater, so that for aeroplane use, it presents the important advance of giving greater power with no addition to what the planes must lift.

SPLITDORF MAGNETO



★

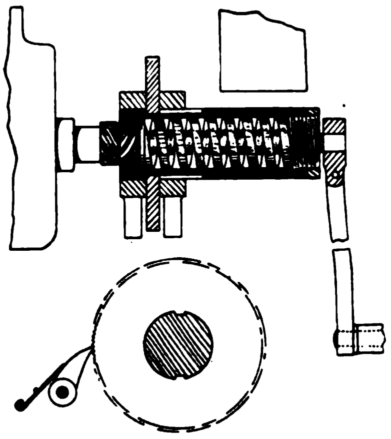
E. Z. Angle Bumper is a new device, constructed by the Cox Brass Manufacturing Company, Albany, N. Y., for attachment to the front of a machine, where it saves the delicate parts from the shock of collisions. It differs from the more usual and older straight forms in that the cross bar is carried up higher, the whole thus meeting the demand existing. Many cars are constructed so as to require a high bar, the manner of holding it up in this device being the angular construction which raises it seven inches. The coil spring, which is four inches long, of .25-inch tempered steel and fine quality, is enclosed within the cylindrical rear portion. In attachment, this form presents the unusual advantage of requiring no drilling whatever, since a special clamp has been developed, this, with the shape of the base portion, holding it firmly in place.



E. Z. ANGLE BUMPER

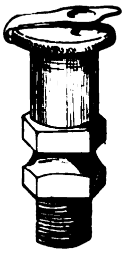
★

The C C Safety Crank is another development of the many efforts to evolve a safe means of starting the car by the usual handle. This was invented and is now being constructed by Charles C. Carll, Indianapolis, Ind. The design is such that the operator may twirl the handle or arrange a lever at the side to do this, by adding a winding drum for the operating cable. The basic idea is the use of a worm thread. The crank is hollow and carries a spring, while the engine end has a quadruple worm which mates with a similar one on the end of the crankshaft. The compression of the spring is sufficient to turn the engine over, and it is wound by means of the handle and the ratchet wheel. A backfire compresses it, the resulting pressure screwing one worm from the other, when the shaft turns idly. In use the cranking may be done with ignition and throttle shut off, and the spring used to turn the engine over later. This is convenient in that the car operator first cranks with everything shut off, or possibly with the throttle open, but ignition in the "off" position. Then, getting into the seat and throwing on the switch, the starter ratchet may be released and the spring permitted to wind the engine over.



CARLL SAFETY CRANK

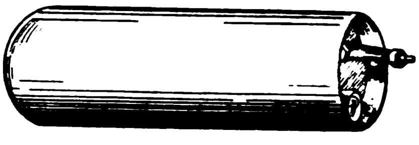
Becco Priming Cup is the trade name given to the newest product of the Beck Company, Rockville Centre, N. Y., a prominent producer of small specialty accessories, all of which are named Becco after the first letters of the firm's name. The priming device is intended for use on a motor, where its simple lines give a more pleasing appearance than other forms. The cap is screwed on firmly, but has a large hole at one side, normally closed by a spring cover. To use this as a primer, the spring is lifted vertically, then swung to one side, thus uncovering the hole. For closure, the end of the spring is struck lightly on one side, when it will jump back into place, the elasticity of the material producing the action and a slight extrusion on the under side centring itself in the hole.



BECCO PRIMING CUP

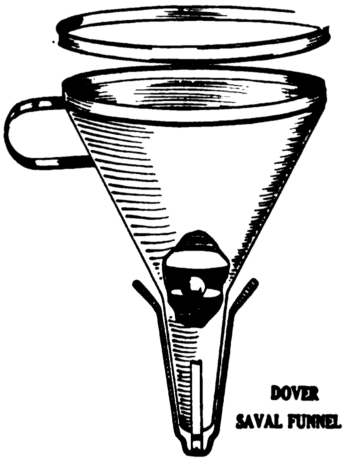
★

Searchlight Gas Tanks are containers for carrying on the car a supply of acetylene gas in a very compact form. Many persons prefer the tank carrier to the small, portable generator. The former contains a substance which absorbs a very large quantity of the compressed fluid, thus holding a greater amount than its size or cubical contents ordinarily would render possible. The Searchlight form has been brought out recently by the Searchlight Gas Company, Chicago, with offices in all of the principal cities, and a very large number of refilling stations scattered around the country, many additional ones being under construction or contracted for completion previous to January, 1912. This is a popular priced tank, and is claimed to give more and better light than others. The container is bought originally filled with gas, but when empty is exchanged at one of the numerous stations for another that is filled.



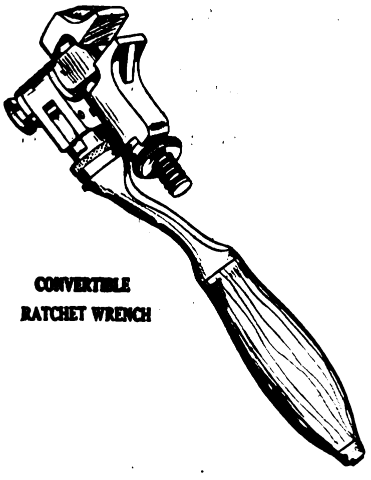
SEARCHLIGHT GAS TANK

The Saval Funnel was produced by the Dover Stamping and Manufacturing Company, Cambridge, Mass., to economize on gasoline when filling a tank. The construction is such that lifting the funnel off the tank opening stops further flow of liquid, and the remainder in the upper portion may be poured back into the can. This result is brought about by an internal ball which is moved up and down by pressure on four external flat springs. When the accessory rests upon these, its weight pushes the ball off the seat, and the liquid flows, but when it is lifted, the valve closes and refuses further egress. In addition, it has a movable hoop for the upper edge, which will hold a chamois or brass strainer, a side handle for convenience in using, and is constructed from heavily copper-plated steel. This firm makes a number of other similar accessories in all varieties of size, shape and method of use, and each of a high grade material.


DOVER SAVAL FUNNEL

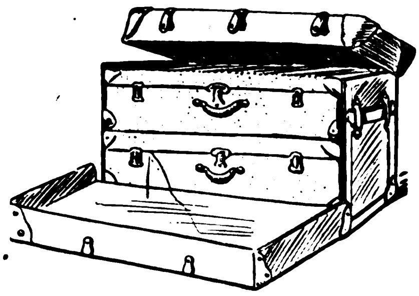
★

The Convertible Ratchet Wrench, pictured herewith, is made by the Convertible Ratchet Wrench Company and sold through Asch & Co., Broadway, New York City. This is an all-around tool, intended to replace straight and S forms. It has a curved handle which carries a ratchet. Above this is the swivel joint which permits action at any inclination, while the thread and thumb screw control the width of jaw opening. The swivel allows placing at different angles and corners, while the ratchet permits operation where space is limited. This gives a very handy tool, which, the maker states, may be used in some 32 different positions. This makes apparent at once the saving of dead weight on the car, allowing as it does the elimination from the vehicle tool kit of all other forms of flat, S and spanner wrenches. In addition, considerable bother is done away with in looking for the various forms, in taking them out of, and putting back in, the tool box, as well as the possibilities for loss and further inconvenience when utilizing them on the road.


CONVERTIBLE RATCHET WRENCH

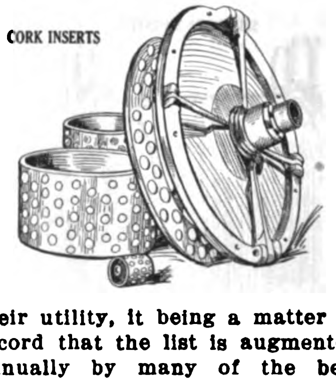
★

The Kamlee Trunk, shown herewith, is like all automobile trunks, a water and dust proof carrier for extra clothing. This product of the Kamlee Company, Milwaukee, Wis., is made in a number of sizes and styles, that depicted in the sketch being the regular with two inner suit cases. By opening a lock and two clasps, the top cover hinges back and the front drops down, exposing both so that they may be lifted out separately or together. The feature of construction which has made this form popular is the interlock edge with a rubber tubing buffer in the bottom of the grooves.


KAMLEE TRUNK

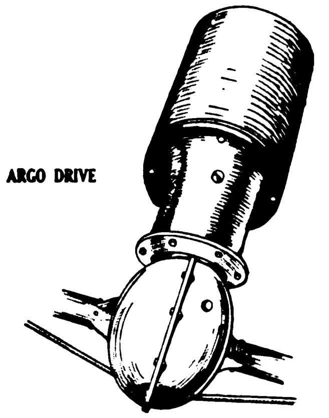
★

Cork Inserts are used as a wearing surface in brakes, clutches and other parts, their special function being to produce a higher coefficient of friction than is possible with any other material. This is a quality which is inherent in the cork, about twice as high a figure resulting as with iron on iron, steel on steel or other combinations. The use for this purpose is patented by the Cork Insert Company, Boston, Mass., which firm is selling licenses therefor. A recent change has been made in the fees asked, by which a greatly lowered price results. The sketch shows pulleys and a plate clutch fitted with the inserts. They are as applicable for the former in the factory which makes the machine, as on the latter in the finished car. The very large number of manufacturers adopting these for use in clutches and brakes presents a fair index of their utility, it being a matter of record that the list is augmented annually by many of the best makers.


CORK INSERTS

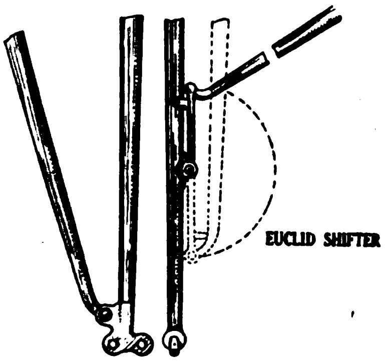
★

The Argo Worm Drive, which is a final member in the car propulsion, was developed by the Argo Electric Vehicle Company, Bay City, Mich., for use on its line of battery driven machines for both commercial and pleasure service. As shown herewith, the entire differential as well as reduction gears are enclosed by the small, compact and exceedingly neat metal housing. The size of this is the most remarkable point about it, although its simplicity merits considerable attention. There are four separate parts to the assembly: The front casing which is a round shell, the middle portion of somewhat similar shape but having two flanged ends for attachment to the other members, and the rear half which is divided vertically. Of the latter, each part rivets and is brazed to one axle tube, so that when bolted together, the two form a complete axle housing.


ARGO DRIVE

★

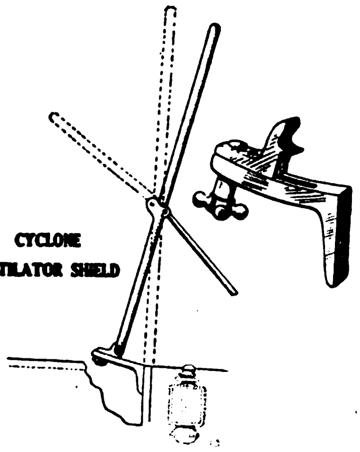
The Euclid Bow Shifter is a novel part of the top supports, which has been marketed recently by the Cleveland Hardware Company, Cleveland, O. The usual socket is constructed so that it is almost impossible for one person to put up or take down the top. This device is designed to remedy that need and has a forward bar which controls the front edge of the cover, attached through the medium of a double hinge. When the inner end of this is in the upper position, the forward portion of the top is down, while with it turned over to the down location shown dotted, the bar must assume a vertical attitude bringing the front of the top back to the out-of-use condition.



EUCLID SHIFTER

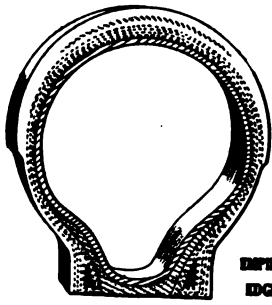
★

Cyclone Ventilator Windshields meet the insistent demand for a form of wind break which will permit of some ventilation in the front seat compartment on fore door cars. The rapid increase in this type of body has evolved this demand, since the additional doors make the forward division close and exceedingly warm, especially below the seat line; that is, for the feet and legs. The Sprague Umbrella Company, Norwalk, O., has just designed and placed on the market this device, which consists of a fixture for attachment to the lower edge of the shield. There it allows of loosening the framework and tipping it sufficiently to admit a small current of air over the hood and dash under the shield through the opening formed, and by the latter is deflected downwards to the floor. There it performs the desired cooling. The sketch shows the complete device as well as the clips which do the work.



CYCLONE VENTILATOR SHIELD

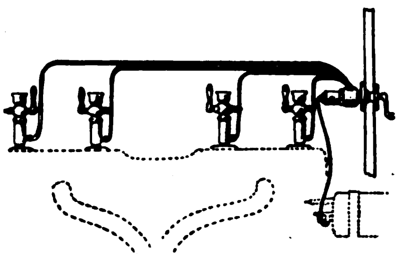
The Empire Straight Edge Tire is a new form of Dunlop shape which has the additional merit of being quick detachable. It is made by the Empire Tire Company, Trenton, N. J., maker of the well known brand of standard shoes and tubes, with the same care, selection of materials and workmanship as the better known product. It is offered in 22 sizes which will be found in stock wherever this make is sold. They are as follows, the full list being given for the convenience of motorists now in the market for this form of casing: Three and a half by 30, 32, 34 and 36; four by 30, 31, 32, 33, 34, 35, 36 and 37; 4.5 by 32, 33, 34, 35, 36, and 37; five by 35, 36 and 37, and 5.5 by 37.



EMPIRE STRAIGHT EDGE Q. D. TIRE

★

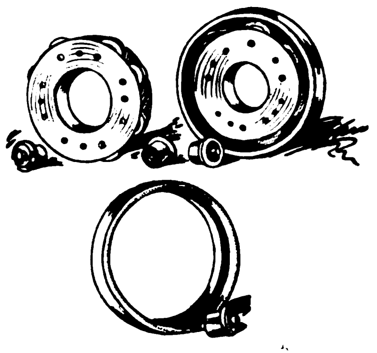
The Disco Self Starter, is made by the Ignition Starter Company, formerly of Grand Rapids, Mich., but now of Detroit. It was originally called the Grisco, the first two letters coming from the town, but the move altered this so the name was changed to suit. This device includes the collection from cylinders of a running engine of sufficient gas under pressure to restart the same, when a stop has been made. This is stored in a circular tank, whence it is available for instant use. The pressure of a dash button permits this to flow through a distributor at the rear of the engine to the cylinder which is ready for firing. In this manner, the motor is turned over by fluid pressure, rotation continuing until the motor picks up its regular cycle.



DISCO SELF-STARTER

★

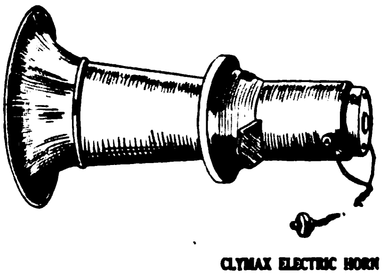
Bower Roller Bearings are of the straight type, but have a formed shoulder, which abuts against a seat in the raceway, thus permitting of the absorption of thrust as well as radial loads. This gives to the roller the single task of carrying radial stresses for which its shape fits it pre-eminently, while the collar on the end of it, does not carry any load in a radial direction, each being made a specialist, so to speak. This principle of action permits the use of unusually large diameters of roller, thus giving the bearings high carrying capacity in comparatively small sizes. Another advantage of the large rollers lies in the slower speed at which they travel, this giving either longer life or if preferred higher spindle speeds. The maker, the Bower Roller Bearing Company, Detroit, Mich., also makes the Zahn bearing, which has the collar replaced by a notch.



BOWER ROLLER BEARING

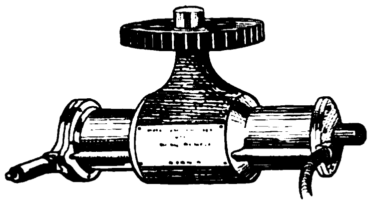
★

A Clymax Electric Horn is suitable for use on any size or make of car, this being a recent addition to the list of current operated signalling devices for automobiles. It is made by the Nonpariel Horn Manufacturing Company, New York, and has all of its mechanism enclosed so the unit as illustrated herewith is complete except the placing of the button which operates it and the connection to a source of energy. Within the rear end portion is placed a small electric armature, which a flow of electricity causes to rotate. Turning this drives forward four striking points, which hit the metal diaphragm at three spots, set 120 degrees apart around the circumference. The action then is not the repeated hammering on a single place as in some horns, but is distributed over a series of 12. This can not help but make for long life and satisfactory action. Each hammer is actuated through a small coil spring which not only absorbs all reflex action but also takes up wear automatically.



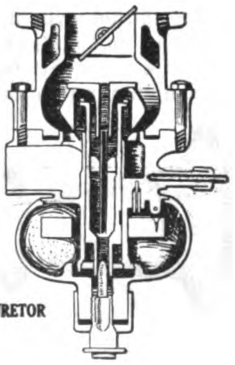
CLYMAX ELECTRIC HORN

Hanna Air Pumps are made by the Troy Auto Specialty Company, Troy, N. Y., and as the accompanying sketch shows, are of the duplex type. That is to say, they have two pistons set on opposite sides of the shaft in the manner which in gasoline engine practise is called "opposed." The cylinders are of phosphor bronze, while the pistons are of steel. These are fitted with two cast iron rings, of the usual spring type, this material being used because of its hardness and excellent wearing qualities. The pump is gear driven, the large member, shown on top in the illustration, being utilized for the drive. This is set in any convenient position to the engine or a rotating shaft, a small gear thereon meshing with the large one. Otherwise, the attachment is very simple, consisting in the usual case of drilling one or two holes for bolts. The material and workmanship is first class, and the result is a pump, which being built as well as the engine, will last fully as long.


HANNA POWER PUMP

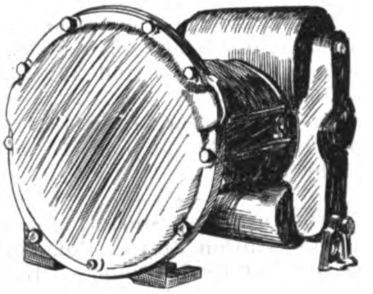
*

The Stewart Carburetor, one of the newest vaporizers to appear on the market, is a far western product, the maker, the Alfred C. Stewart Machine Works, being located in Los Angeles, Cal. A section is shown herewith, this bringing out the construction marked by the entire elimination of springs, gravity being depended upon to operate the only moving part, the air valve. It is held by the maker that springs may lose their temper and thus become unreliable, but that the force of gravity never alters. This valve, which is given the distinction of being the principal part, is in three pieces, acting in unison, so the effect is as of but one. By its movement, it covers or uncovers openings through which air enters, carrying with it the gasoline spray and forming a combustible mixture. When the engine demands rise, the part lifts and a greater area of aperture is put into action, thus supplying the motor cylinders with more gas. The air passage is double, the inner part being somewhat tortuous, so that the intermingling is both complete and very intimate.


STEWART CARBURETOR

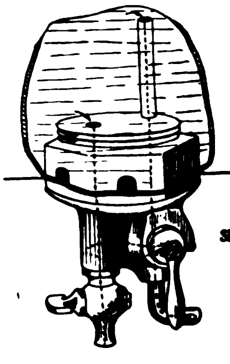
*

The American Electric Headlight is made by the Remy Electric Company, Anderson, Ind., also maker of the Magnetolite combination ignition and lighting current generator, as well as a full line of other ignition units and supplies. The latest product, which is shown in the appended sketch, is for lighting only, being intended as a source of energy for a single head or searchlight, or a pair of them. As the drawing brings out, this is massive enough to withstand road shocks.


AMERICAN ELECTRIC HEADLIGHT

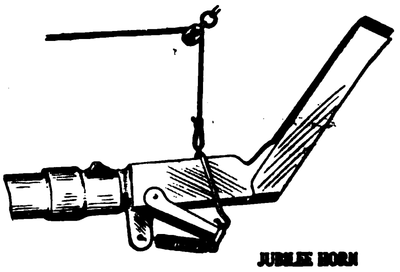
Multibestos Brake Lining is a new frictional material for facing brake shoes, as its name indicates. This is specially woven by the Standard Woven Fabric Company, Worcester, Mass., upon looms which have been designed and constructed for this purpose. It is a mineral product composed of a series of brass wires interlaced with fibres of asbestos. By means of the process followed in its production, none of the layers or threads may become separated from the rest. This firm has produced water proof fabrics for many years, and its experience in the treatment of materials along these lines has brought about a skill which is applicable to heat proofing with equally good results. The handling of this substance includes the permeating of every interstice with a compound to the point of saturation. It is said of the resultant brake lining that it will not char or burn with the heat of friction, even when continued to a dull red; that it is, in addition, dust, water, oil and grease proof; that it is better than metallic, leather, fibre or other forms of lining; that it can be machined readily and will withstand the stresses incident thereto, and that it gives the maximum gripping effort.

Sentinel Fuel Alarms were brought out to give warning to the driver of a car that his gasoline was getting low in the tank and required replenishing. They may be installed in any form of container, but a small flat spot being necessary for attachment. There is a standpipe, through which the fuel flows ordinarily. When the level falls below this, the motor stops, indicating that but an inch or so of gasoline is left. By turning the reserve cock around half way, this remnant may be utilized, the liquid then flowing through the hole beside the standpipe. The second pet cock is for cleaning purposes only and bears no relation to the operation of the device. When the main lever is set horizontally to the right, all flow is stopped and the car cannot be operated. It is made by C. J. Koller & Co., Philadelphia, Penn.


SENTINEL GASOLINE TANK ALARM

*

The Jubilee Horn, a new high class, mellow tone chime horn, is now being marketed by the Waite Auto Supply Company, Providence, R. I., and other dealers. This is an inexpensive product which can be attached by anyone with few tools, so that practically every car owner can afford one. It is adaptable to all sizes of machines from the smallest to the largest, and is made in different dimensions to fit the range of powers. It is self-cleaning and has no parts to get out of order. The method of operation is by pedal, which closes a gate and brings the sound chamber into play as a reflector of the exhaust gas passage. When possible, the maker states, the operating member should be placed so that the horn may be worked by the heel while the toe is actuating either brake or clutch.


JUBILEE HORN

INFORMATION FOR THE REPAIRMAN.

CUTTING SPEEDS AND FEEDS.

Diameter of work in inches	—Roughing cuts— Speed in revolutions per minute	Feed	—Finishing cuts— Speed in revolutions per minute	Feed
		Brass.		
1 and less	380	25	380	25
1 to 2	318	25	318	25
2 to 4	255	25	255	25
4 to 6	229	25	229	25
6 to 12	191	25	191	25
		Iron, Cast.		
1 and less	121	20	121	20
1 to 2	112	20	112	16
2 to 4	96	20	96	10
4 to 6	80	16	80	6
6 to 12	63	14	63	6
12 to 20	63	10	63	4
		Iron, Wrought.		
1 and less	112	25	121	30
1 to 2	80	20	96	30
2 to 4	80	20	80	25
4 to 6	72	20	72	25
6 to 12	63	15	72	20
12 to 20	57	12	58	16
		Steel.		
1 and less	63	25	63	30
1 to 2	57	25	57	30
2 to 3	57	25	48	30
3 to 6	48	20	48	30

In turning and shaping metal on the lathe, planer or shaper there are certain speeds which must not be exceeded or the tool will suffer injury. In taking a roughing cut on the lathe on wrought iron the speed must be lower than when a finishing cut is being made, because of the fibrous nature of the metal, but with the other metals the speed can be the same with roughing as finishing cuts. In the case of brass the feed is the same at all speeds, whether a rough or finishing cut is being made, though with cast iron the feed should be slower in making finishing cuts. With wrought iron and steel, the feed is faster on finishing cuts than on roughing cuts. As the diameter of the piece turned is increased, the number of revolutions is reduced in proportion.

Adjusting Valve Tappets—If a modern engine becomes noisy in the first few thousand miles of its running life, a likely cause is poor adjustment of the valve tappets. With the strong valve springs now used on nearly all cars, the tappet heads and valve stem ends wear faster than they used to do, and too wide a clearance at this point is a prolific cause of noise. The adjustment of the screwed tappet heads on any engine is considerably facilitated by the use of feeler gauges, plus a couple of special open ended spanners, which exactly fit the hexagons of the loose tappet head and its lock nut. A piece of tin, of about .031 inch in thickness, should be slipped between the exhaust valve stem end and the tappet head, after the engine has been revolved by means of the starting handle until the tappet to be adjusted is at its lowest point. The tappet head should then be screwed up till it nips the feeler gauge against the valve toe; then the lock nut must be tightened, and the gauge withdrawn. This plan is much better than a visual test. On inlet valves, the same process is followed except that the gauge is about .015 inch thick. The exhaust valve stems heat more and expand to a greater degree; therefore more clearance is needed between them and the lifting plungers.

Cleaning Oil Soaked Belt—When the belt has become oil-soaked and will not stay on the machine, a good method of cleaning it is as follows: Coil the belt loosely in a tub of sufficient size, and cover with whiting. Be sure that the whiting gets in between the coils of the belt, and it will be only a short time before the whiting will absorb the oil from the leather. It will then only need to be wiped clean to be ready for further use.

WEIGHT PER FOOT OF SQUARE AND ROUND IRON BARS, IRON WEIGHING 480 POUNDS PER CUBIC FOOT.

Thickness or diameter in inches..........	Weight of square bar one foot long........	Weight of round bar one foot long........	Thickness or diameter in inches..........	Weight of square bar one foot long........	Weight of round bar one foot long........
1-16	.013	.010	2 1-16	14.18	11.14
1-8	.052	.041	2 1-8	15.05	11.82
3-16	.117	.092	2 3-16	15.95	12.53
1-4	.208	.164	2 1-4	16.88	13.25
5-16	.326	.256	2 5-16	17.83	14.00
3-8	.469	.368	2 3-8	18.80	14.77
7-16	.638	.501	2 7-16	19.80	15.55
1-2	.833	.654	2 1-2	20.83	16.36
9-16	1.055	.828	2 9-16	21.89	17.19
5-8	1.302	1.023	2 5-8	22.97	18.04
11-16	1.576	1.237	2 11-16	24.08	18.91
3-4	1.875	1.473	2 3-4	25.21	19.80
13-16	2.201	1.728	2 13-16	26.37	20.71
7-8	2.552	2.004	2 7-8	27.55	21.64
15-16	2.930	2.301	2 15-16	28.76	22.59
1	3.333	2.618	3	30.00	23.56
1 1-16	3.763	2.955	3 1-16	31.26	24.55
1 1-8	4.219	3.313	3 1-8	32.55	25.57
1 3-16	4.701	3.692	3 3-16	33.87	26.60
1 1-4	5.208	4.091	3 1-4	35.21	27.65
1 5-16	5.742	4.510	3 5-16	36.58	28.73
1 3-8	6.302	4.950	3 3-8	37.97	29.82
1 7-16	6.888	5.410	3 7-16	39.39	30.94
1 1-2	7.500	5.890	3 1-2	40.83	32.07
1 9-16	8.138	6.392	3 9-16	42.30	33.23
1 5-8	8.802	6.913	3 5-8	43.80	34.40
1 11-16	9.492	7.455	3 11-16	45.33	35.60
1 3-4	10.21	8.018	3 3-4	46.88	36.82
1 13-16	10.95	8.601	3 13-16	48.45	38.05
1 7-8	11.72	9.204	3 7-8	50.05	39.31
1 15-16	12.51	9.828	3 15-16	51.68	40.59
2	13.33	10.47	4	53.33	41.89

In buying round or square iron bar stock it is often desirable to know the weight of bars of certain section and length, with a view of more easily computing the cost and amount of material. The figures given above can be used for steel as well if allowance is made for the difference in weight, steel weighing 490 pounds the cubic foot. This will make but little difference in case of the bars of smaller section and in case of the larger diameters it will be merely necessary to add 1-48 of the weight to that given for iron for an accurate determination of the amount of steel in bars of the same size and length.

Contact Breaker Repair—A motorist was stranded one day by a small flat steel spring forming part of a magneto contact breaker parting. The car was equipped with magneto ignition only and there was no reserve system to run on. After some thought, the amateur repair man obtained a small Para rubber patch from the tire repair kit, folded it several times and squeezed it in between the rocker arm and a convenient screw that luckily lent itself to the purpose. A piece of fine brass wire was used to make a suitable contact, and with the rubber acting as a spring, the magneto worked almost as well as ever.

Peculiar Cause of Knocking—The car was a popular four-cylinder make about a year old. It was brought to the shop for a thorough overhauling, and for taking up all the bearings. When the job was complete and the engine operated, a very severe knock developed that sounded exactly like a loose bearing. After considerable experimenting, it was found that one of the pistons touched a shoulder in the top of the cylinder, this because the packing between the cylinder and crankcase had been reduced in thickness a trifle. A thicker packing cured the trouble.

A. L. A. M. STANDARD HORSEPOWER FORMULA.

Bore of Cylinder Squared × Number of Cylinders ÷ 2.5.

Bore		Horsepower			
Inches	Mill.	1 Cyl.	2 Cyl.	4 Cyl.	6 Cyl.
2.500	64	2.500	5.000	10.000	15.000
2.625	68	2.750	5.500	11.000	16.500
2.750	70	3.000	6.000	12.100	18.200
2.875	73	3.312	6.225	13.250	19.875
3.000	76	3.600	7.200	14.400	21.600
3.125	79	3.937	7.812	15.625	23.437
3.250	83	4.250	8.500	16.900	25.400
3.375	85	4.562	9.125	18.250	27.400
3.500	89	4.900	9.800	19.600	29.400
3.675	92	5.250	10.500	20.250	31.600
3.750	95	5.675	11.250	22.500	33.750
3.875	99	6.000	12.000	24.000	36.062
4.000	102	6.400	12.800	25.600	38.400
4.125	105	6.812	13.625	27.250	40.900
4.250	108	7.250	14.500	28.900	43.800
4.375	111	7.625	15.312	30.625	45.937
4.500	114	8.100	16.200	32.400	48.600
4.675	118	8.562	17.125	34.250	51.600
4.750	121	9.000	18.000	36.100	54.100
4.875	124	9.500	19.000	38.000	57.000
5.000	127	10.000	20.000	40.000	60.000
5.125	130	10.500	21.000	42.000	63.000
5.250	133	11.000	22.000	44.100	66.200
5.375	137	11.562	23.000	46.000	69.100
5.500	140	12.100	24.200	48.400	72.600
5.675	143	12.625	25.312	50.625	75.937
5.750	146	13.250	26.500	53.000	79.500
5.875	149	13.812	27.625	55.250	82.900
6.000	152	14.400	28.800	57.600	86.400

The formula used generally in this country is that proposed by the A. L. A. M., which gives merely an approximation, but as it has been adopted by a number of states as the method of determining the amount of registration tax on a horsepower basis, the tabulation above will be serviceable for ready reference, as it not only indicates the bore in inches, but in equivalent metric units, and gives the horsepower for engines of that cylinder bore having one to six cylinders. For an odd number of cylinders, merely multiply the value given for one cylinder by the number of cylinders.

LENGTH OF STANDARD PIPE NIPPLES.

Nominal diameter	Outside diameter of pipe	Threads an inch	Overall length of nipples					
			Close	Short	Long			
0.125	0.40	28	0.750	1.5	2.0	2.5	3.0	3.5
0.250	0.54	18	0.875	1.5	2.0	2.5	3.0	3.5
0.375	0.68	18	1.000	1.5	2.0	2.5	3.0	3.5
0.500	0.84	14	1.125	1.5	2.0	2.5	3.0	3.5
0.750	1.05	14	1.375	2.0	2.5	3.0	3.5	4.0
1.000	1.32	11	1.500	2.0	2.5	3.0	3.5	4.0
1.250	1.66	11	1.625	2.5	3.0	3.5	4.0	4.5
1.500	1.90	11	1.750	2.5	3.0	3.5	4.0	4.5
2.000	2.38	11	2.000	2.5	3.0	3.5	4.0	4.5

There is often much confusion in the minds of those not familiar with mechanical processes caused by poor nomenclature or designation of sizes, and in no case is this shown more often than in determination of pipe and tubing sizes. As a general thing pipe is measured by the bore, while tubing dimensions are based on the outside diameter. As an example, a one-eighth inch pipe would actually be four-tenths inch outside diameter, a quarter inch pipe .54 inch outside diameter, the bore in each case being a little more than the size would indicate. A piece of tubing, at the other hand, would have an outside diameter equal to the size. The table above gives the sizes, the actual outside diameter and the number of threads an inch, as well as the overall length of standard pipe nipples commonly used in motor car work.

Hints on Tempering—To temper small springs, etc., heat to a cherry red and cool in rain water, dip in lard oil, hold over the fire until the oil burns off; repeat the oil dip twice more and then cool in oil. This is reliable if done properly.

SPEED OF TWIST DRILLS.

Diameter of drill	Speed			Diameter of drill	Speed		
	For soft steel...	For cast iron...	For brass......		For soft steel...	For cast iron...	For brass......
1-16	1824	2128	3648	1 1-16	108	125	215
1-8	912	1064	1824	1 1-8	102	118	203
3-16	608	710	1216	1 3-16	96	112	192
1-4	456	532	912	1 1-4	91	106	182
5-16	365	425	730	1 5-16	87	101	174
3-8	304	355	608	1 3-8	83	97	165
7-16	260	304	520	1 7-16	80	93	159
1-2	228	266	456	1 1-2	76	89	152
9-16	203	236	405	1 9-16	73	85	145
5-8	182	213	365	1 5-8	70	82	140
11-16	136	194	332	1 11-16	68	79	135
3-4	152	177	304	1 3-4	65	76	130
13-16	140	164	280	1 13-16	63	73	125
7-8	130	152	260	1 7-8	60	71	122
15-16	122	142	243	1 15-16	59	69	118
1	114	133	228	2	57	67	114

An important condition, that has material bearing upon the service given by twist drills, is that they may be driven at the best speed for cutting different substances. The softer the metal the faster the drill can be revolved, and the larger the diameter of the tool the slower its speed. Cast iron can be drilled faster than steel, and brass faster than either of the harder metals.

Treating Sulphated Plates—If, on test, the efficiency of a storage battery cell sinks to 50 per cent., or lower, the plates should be removed and washed thoroughly with distilled water. They are then placed in a cell containing a two to five per cent. solution of caustic soda in water, and the charging current sent through the cell in the usual way. If the sulphate on the positive plate does not disappear during the time of the ordinary charge, and the solution gives an acid reaction with litmus paper, more caustic soda must be added to the solution, and the charging continued until the plate has the usual chocolate appearance. The plates should then be removed from the soda solution, well washed, replaced in the sulphuric acid solution, and the charging continued until gassing begins. Many cells have had their efficiencies raised from 25 to 75 per cent. by six hours' charge, and many electricians believe that any plate which will hold together will well repay treatment by this method.

Extemporized Tube Protector—A medical man on an important call had a tire burst when several miles from home, and only had a spare inner tube, no outer casing or sleeve. Knowing that it was useless to put the tube in the shoe that had a 2.5 inch burst, he was rather nonplussed, but in looking over the tool kit he noticed that the roll in which the tools were carried was of heavy canvas. This was cut and a large piece of the flap was used between the inner tube and the shoe at the damaged portion, and the run to the patient's home was made without trouble. It is well to note that an ordinary dusting or polishing cloth, or a piece of chamois skin could have been used for the same purpose in an emergency.

Annealing Small Steel Pieces—To anneal small tools or pieces of steel heat up slowly to a red, and then take two pine boards and lay the hot steel between them, and screw them in a vise. As the steel is hot it sinks into the pieces of wood and is firmly enclosed in an almost air tight charcoal bed. When taken out after cooling it will be found to be very soft. This operation can be repeated if necessary. The boards prevent the steel from becoming cooled off too quickly, especially if the pieces are small.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to deal in motor cars, accessories, etc.:

Wachusett Cab & Automobile Company, Kittery, Me.; capital, $5000; incorporators, Horace Mitchell, C. E. Smothers, M. G. Mitchell.

The Motor Cab Company of Boston, Boston, Mass.; capital, $1000; incorporators, Otto E. Lawler, Leo J. Dunne, Harold D. Cushman.

The University Garage, Boston, Mass.; capital, $2000; incorporators, Newton A. DeWitt, Charles A. McLean, Thomas D. Cahill.

The D. B. Gray Engineering Company, Amesbury, Mass.; capital, $50,000; incorporators, Robert H. Hills, William E. Biddle, Budd H. Gray.

The Fothergill Motor Company, Boston; capital, $100,000; incorporators, Rufus B. Skinner, A. Chesley York, Arthur L. Thomas, Edith F. Gardner.

The Macker Motor Company, Worcester, Mass.; capital, $16,000; incorporators, Melvin A. Macker, Louis E. Bragg, Robert S. Smith.

Van Nuys Auto Garage, Los Angeles, Cal.; capital, $10,000; incorporators, F. R. Cyriacks, Fred S. Desiter, M. C. Frantz, T. K. Kase, L. E. Durrow.

The Plaquemine Motor Car Company, Plaquemine, La.; capital, $10,000; president, Dr. W. A. Holloway; vice president, Henry Nadler; secretary and treasurer, E. B. Schwing.

Broad Street Garage, Richmond, Va.; capital, $5000; president, A. Zachary; vice president, O. B. White; secretary, C. Stokes.

Marathon Car Company, Greenville, S. C.; capital, $15,000; president and treasurer, C. W. Ellis; secretary, H. D. Caldwell.

Pittsfield Auto Garage Company, Pittsfield, Mass.; capital, $3000; incorporators, Mary I. Mills, Arthur A. Mills, Arthur J. Mills.

Pullman Automobile Company, Philadelphia; capital, $25,000; treasurer, Orland M. Parke, 5347 Wynnefield avenue.

Pierce-Arrow Sales Company of Buffalo, Buffalo, N. Y.; capital, $75,000; incorporators, F. B. Schanne, F. M. Livingston, J. C. Williams.

Herkimer Garage Company, Buffalo, N. Y.; capital, $10,000; incorporators, Rowland J. Conover, Louis F. Jillson, Robert E. Conover.

Buffalo Tire Company, Buffalo, N. Y.; capital, $500; incorporators, Alfred C. Bidwell, William Preiss, Charles H. Bowe.

The Motor 'Bus Company, Chicago; capital, $50,000; incorporators, Clarence E. Morris, Frank Page and others.

The Blair-James Auto Company, Ogden, Utah; capital, $25,000; president, Joseph S. Campbell; vice president, M. W. Kimball; secretary, J. Parker Blair; S. H. Blair, L. H. Blair, H. C. Blair, Jr.

Grassfield Automobile Company of St. Joseph, St. Joseph, Mo.; capital, $2000; incorporators, E. A. Grassfield, George Vetuske, F. E. Frank.

The Dubuque Rambler & Auto Supply Company, Dubuque, Ia.; capital, $10,000; incorporators, Archy Frater, E. J. Schreck, B. M. Fitzgerald, William E. Ellwanger, William M. Bergener.

Great Western Motor Car Company, Los Angeles, Cal.; capital, $5000; incorporators, Le Roy Robinson, J. F. Huber, O. H. Robinson.

M. & P. Electric Vehicle Company, Detroit; capital, $10,000; incorporators, Myron C. Messiman, Burton Grandy.

Lenox Motor Car Company, Newark, N. J.; capital, $25,000; incorporators, L. Lippman, J. M. Shreffler, M. Lippman, C. Shreffler.

Harder Auto Truck Company, Chicago; capital, $100,000; incorporators, J. M. Johnston, H. P. Chandler, E. Cornwall.

Oldsmobile Company of Texas, Dallas, Tex.; capital, $10,000; incorporators, Clinton C. Clark, Rhodes S. Baker, Wendel Spence.

Wishart-Dayton Auto Truck Company of New York, New York City; capital, $25,000; incorporators, R. A. Inch, S. E. Wishart, Jr., J. B. Smith.

Knight Garage, New Haven, Conn.; capital, $15,000; incorporators, Harry T. Hotchkiss, George E. Tester, Pierrepont B. Foster.

Windsor Automobile Company, Windsor, Vt.; capital, $2000; incorporators, F. L. Cabot, Willard D. Cabot, Jessica White Cabot, Frank B. Tracy, J. H. Kinney.

The Milwaukee Auto Specialty Company, Milwaukee, Wis.; capital, $75,000.

Cosmopolitan Motor Company, New York City; capital, $10,000; incorporators, John Devine and John Kirby, 41 Wall street; Albert G. Armento.

Butler County Auto Company, Butler, Penn.; capital, $10,000; incorporators, John Yourkins, J. N. Patterson, A. C. Hileman, G. A. Evans, W. J. Rattigan, Ralph Gregg, J. L. Holben, B. L. Barnhart, A. E. Butler.

General Auto & Repair Company, Chicago, Ill.; capital, $25,000; incorporators, W. R. Potter, G. H. Davis, Jr., F. H. T. Potter.

Motor Vehicle & Marine Construction Company, Sewaren, N. J.; capital, $15,000; incorporators, Henry E. Acker, Tottenville, N. Y.; Albert B. Boynton, William C. Muir, Sewaren.

Central Auto Supply Company, Indiana Harbor, Ind.; capital, $600; directors, C. C. Robinson, F. E. Stephens, B. S. Gardner.

Sky-Pilot Motor Company, Los Angeles, Cal.; capital, $100,000; directors, E. T. Banning, C. T. Sheldon, George Bentley, E. M. Fisk, S. W. Odell.

G. E. & H. J. Habich Company, Boston, Mass.; capital, $25,000; incorporators, Henry J. Habich, G. E. Habich, George G. Taylor.

Acme Motor Car Company, Worcester, Mass.; capital, $40,000; incorporators, William Vincent, Albert D. Watson, William C. Foley.

Pyramid Automobile Company, New Haven, Conn.; capital, $5000; president, Walter H. Goodrich; secretary and treasurer, Henry P. Johnson.

Meteor Automobile Company, Mt. Vernon, N. Y.; capital, $50,000; incorporators, Frank A. Kateley, 11 Wallace avenue; Albert F. Goscheldt, 1554 Cottage avenue; John Emmeluth, 148 South First avenue.

Sunset Automobile Corporation, Los Angeles, Cal.; capital, $50,000; directors, H. A. Perkins, Herbert Howard, C. R. Clarke, Fred Myers, L. M. Fall.

Reynolds Motor Car Company, Norwalk, Conn.; capital, $4000; incorporators, Frank Reynolds, William L. Olsen, Grale Olsen.

Indiana Motor Car Company, Dallas, Tex.; capital, $10,000.

Belmont Auto Company, Shelbyville, Tenn.; capital, $5000; incorporators, F. N. Stower, W. A. Frost, H. W. Woolsey, John D. Hutton.

Virginia Automobile Garage & Repair Corporation, Norfolk, Va.; capital, $10,000; president, H. L. Page; vice president, A. M. Bopp; secretary and treasurer, P. A. Page.

Oskaloosa Garage Company, Oskaloosa, Ia.; capital, $10,000; president, D. P. McClure; vice president, C. W. Payne; secretary, A. O. Watland; treasurer, E. P. McClure.

International Motor Service Association, 25 Broad street, New York City; capital, $100,000; incorporators, William H. Brearley, Walter W. Friend, Irene A. Mouses.

Finlay Auto Company, Brooklyn, N. Y.; capital, $10,000; directors, William Finlay, Joseph Scholl, Ernest Finlay.

Bradford Auto Exchange, Bradford, Penn.; capital, $30,000; incorporators, F. H. Reed, L. I. Holmes, F. H. Leogan, S. L. Libbitts, F. L. Gallup.

Asheboro Motor Car Company, Asheboro, N. C.; capital, $5000; incorporators, M. L. Davis, C. E. Davis, C. Rush, I. N. Cox.

Etheredge Motor Company, Columbia, S. C.; capital, $10,000; president, E. J. Etheredge; vice president and manager, C. L. Etheredge; secretary and treasurer, Robert L. Merrill.

Greensboro Motor Car Company, Greensboro, N. C.; capital, $25,000; incorporators, H. M. Chamblee, W. M. Fowler, W. J. Sherrod.

Teven Garage Company, 148 West 118th street, New York City; capital, $10,000; incorporators, Joseph C. Graveur, Martha Graveur, Rosa Teven.

G. & S. Accessory Company, 220 West 97th street, New York City; capital, $100,000; incorporators, Frank D. Glover, John G. Stuart, John Z. Lowe, Jr.

Portsmouth Automobile & Machine Company, Portsmouth, O.; capital, $10,000; incorporators, Lincoln Poole, Walter O. Ruhlman, Roy A. Oakes, Filmore Musser, Edward C. Riegel.

Perry Auto Company, Taunton, Mass.; capital, $3000; incorporators, Frank W. Perry, James B. Wetherell, Homer L. Land.

Corson Auto Company, Springfield, Mass.; capital, $15,000; incorporators, Harold E. Corson, Frank H. Chapman, Waldo R. Forrister, Harry K. Smith.

Hamlin-Foster Auto Company, Portland, Me.; capital,

$100,000; incorporators, Arthur D. Hamlin, James L. Foster, George W. Merrow.

New England Wells-Block Tire Company, New Haven, Conn.; capital, $16,000; president, Frederick W. Wells; secretary and treasurer, Arthur C. Veith.

Vera Motor Car Company, Boston, Mass., and Providence, R. I.; capital, $60,000; incorporators, Edward E. Clark, George M. Polland, Mary A. Sweeney.

Bedford-Bergen Auto Exchange, Brooklyn, N. Y.; capital, $25,000; incorporators, M. Keve, B. Brown, Brooklyn; C. Goldstein, New York City.

Pathfinder Motor Company, Los Angeles, Cal.; capital, $50,000; incorporators, A. J. Hawkins, D. J. Gonver, I. N. Johnson.

Shaw-Lundin Auto Company, Kittery, Me.; capital, $10,000; president, Burton W. Shaw, Newton Centre, Mass.; treasurer and clerk, Horace Mitchell, Kittery.

Francis Motor Sales Company, Jefferson, N. Y.; capital, $5000; directors, Guy M. Francis, Worcester, N. Y.; Richtmyer Hubbell, Charles E. Nichols, Jefferson.

Fredericksburg Motor Company, Inc., Fredericksburg, Va.; capital, $10,000; president, L. R. Colbert, Massaponax, Va.; vice president, Alvin T. Embrey, Fredricksburg; secretary and treasurer, H. C. Biscoe, Fredericksburg.

Auto Tire & Cycle Company, Birmingham, Ala.; capital, $2000; president, Reese Stansel; secretary and treasurer, W. R. Grimes.

Consolidated Auto Company, Columbia, S. C.; capital, $5000; incorporators, J. B. Roddey, W. W. Pearce, John J. Cain, J. P. Matthews.

Automobile Sundries Company, 114 East 23rd street, New York City; capital, $10,000; incorporators, George F. Merritt, John E. Waltz, Theodore M. Crisp.

Auto Accessories Manufacturing Company, Cincinnati, O.; capital, $15,000; incorporators, S. C. Roettinger, A. L. Habekotte, W. A. Paxton, Henry E. Beebe, William Stichtonoth.

Little Giant Motor Car Company, Camden, N. J.; capital, $125,000; incorporators, W. C. Davis, D. Cooney, A. H. Holl, A. E. Simmons.

Amalgamated Motors Company, Los Angeles, Cal.; capital, $500,000; directors, C. B. Croner, C. J. Schroeder, J. L. Kirkman.

American Silent Motors Company, Los Angeles, Cal.; capital, $2,000,000; incorporators, Benjamin Waterfall, R. J. Connors, Ernest Kouwen-Hoven.

Buffalo Motor Vehicle Service Company, Buffalo, N. Y.; capital, $100,000; incorporators, W. R. Huntley, J. H. Vail, C. H. Huntley.

Mogul Motor Truck Company, Chicago; capital, $125,000; incorporators, G. C. Griffiths, J. S. James, F. Dawson.

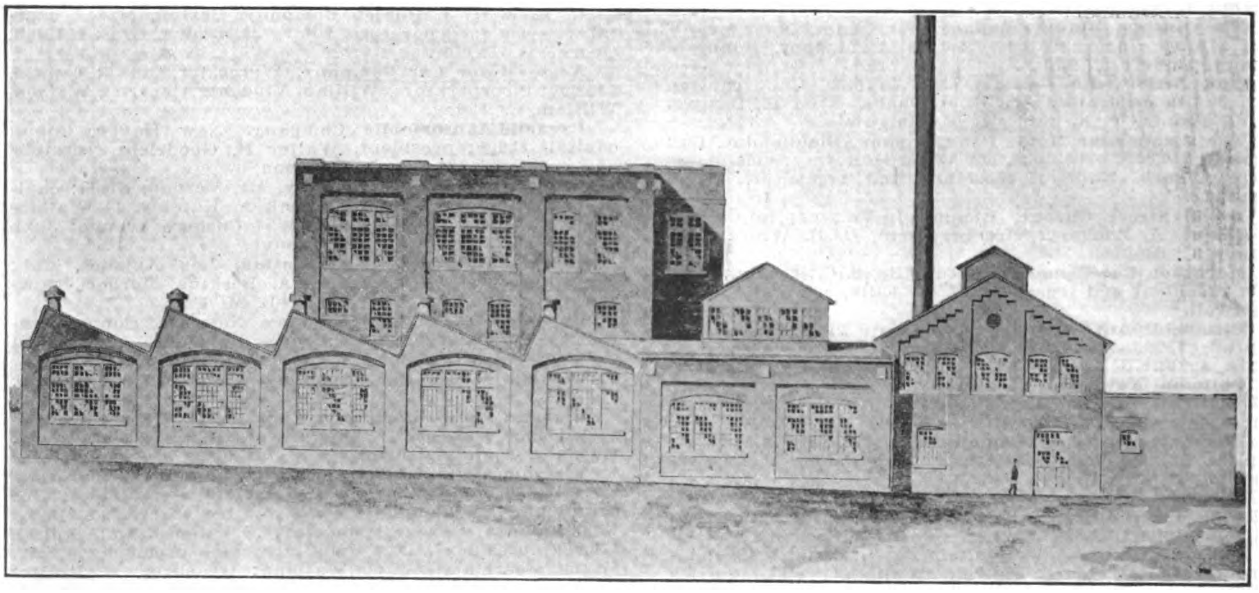
Beverly Automobile Company, Los Angeles, Cal.; capital, $10,000; incorporators, John Wright, Fred L. Moses, Charles H. Pool.

The Co-Operative Automobile Supply Company, Indianapolis, Ind.; capital, $25,000; incorporators, B. H. Ripenbark, J. C. Curtis, J. F. Boessinger.

Merchants' Motor Delivery Company, Fort Wayne, Ind.; capital, $25,000; incorporators, A. W. Harris, William Hahn, A. H. Fernwalt.

Davenport Auto Company, Davenport, La.; capital, $10,000; president, August A. Lebermann; secretary and treasurer, Charles A. Frey.

Prudence Motor Truck Company, Brooklyn, N. Y.; capital, $100,000; incorporators, Herbert Cooper, Arthur Cooper, Alfred G. Yeomans, Charles J. Diegert, Franklin C. Haven.



Front Elevation of the New Factory Building Under Process of Erection for the Knight Tire & Rubber Company, Canton, O.

WITH THE MANUFACTURER

A. D. McLachlan, formerly with the Royal Tourist Motor Car Company, has become general sales manager for the Sanford-Herbert Company, Syracuse, N. Y., maker of the Sanbert truck. Mr. McLachlan was with the Cleveland concern for 10 years.

J. I. Handley, president of the American Motors Company, Indianapolis, Ind., maker of American cars, has returned from a trip to Manitoba, Can., and including some of the larger centres in the West, South and East. He reports the automobile trade to be in promising condition throughout the entire country.

The Auto-Pump Company of Springville, N. Y., has filed incorporation papers, with a capital of $6000. The incorporators are: Ralph B. Waite, Bertha C. McInerney and Ira W. Smith.

The Miles Motor Tire Spring Company has been organized with capital of $200,000 and will erect a plant at Braddock, Penn. The incorporators are: Charles W. Dressler, Thomas C. Aten, Charles L. Balyser, Zeneb A. Delwarts, Braddock; Frederick Miles, Wilkingsburg, Penn., and M. R. Myers, Untindon, Penn.

The Suburban Truck Company of Camden, N. J., has been incorporated for the purpose of manufacturing a new line of commercial vehicles. The capital is $10,000 and the incorporators: J. Edward Fagan, George H. Jacobs, Walter B. Carroll.

The Krupp Motors Company has been chartered to manufacture motor vehicles and parts at Pittsburg, Penn. Those interested in the organization are: D. Morgan, G. H. Anderson and James McMorran. The capital is $250,000.

The International Accessories Company, Detroit, Mich., announces that it is ready to place the Speedo carburetor, which was given its first trials in a recent race meet on the Pacific Coast, on the market in large numbers. Already some 3000 of these instruments have been manufactured, and the product will be distributed by the Fulton-Grubb Company of Detroit.

The United States Tire Company, New York City, is issuing a 10-page booklet entitled "The Tale of a Tortured Tire," which describes in an interesting manner the hardships of a shoe in the hands of an inexperienced chauffeur. The abuses cases are subjected to are brought out in the illustrations.

The Knight Tire & Rubber Company, Canton, O., is progressing rapidly with the construction of its factory in that city, an illustration of which is presented herewith. Every effort will be made to have the structure ready for occupancy shortly after Jan. 1.

The Remy Electric Company, Anderson, Ind., maker of Remy magnetos for ignition and lighting service, announces that the Kansas City branch has been removed from 416 East 15th street to 509 on the same thoroughfare. The change was made to secure more commodious quarters and enable the handling of rapidly increasing business in that territory.

S. W. Seeley, well known in the trade as editor of the parts and accessories department of the Cycle & Automobile Trade Journal, Philadelphia, Penn., has resigned to join the editorial staff of the Keystone Publishing Company.

The Moon Motor Car Company, St. Louis, Mo., has found it necessary to add another structure to its already extensive plant. This will increase the capacity about 25 per cent., and enable much quicker delivery of cars.

The Hyatt Roller Bearing Company, Newark, N. J., has removed its Detroit branch from the Ford building to the second floor of the structure at 754-756 Woodward avenue, where it will have ample facilities to take care of its rapidly increasing business.

The Ohio Motor Car Company, Cincinnati, O., maker of Ohio gasoline cars, announces the appointment of the following agents: W. L. Penny, Richmond, Va.; Central Garage & Machine Shop, Calgary, Alta.; M. R. Cheesman Company, Salt Lake City, Utah.

The Firestone Tire & Rubber Company, Akron, O., is issuing a circular to the trade, calling attention to its non-skid Firestone tires.

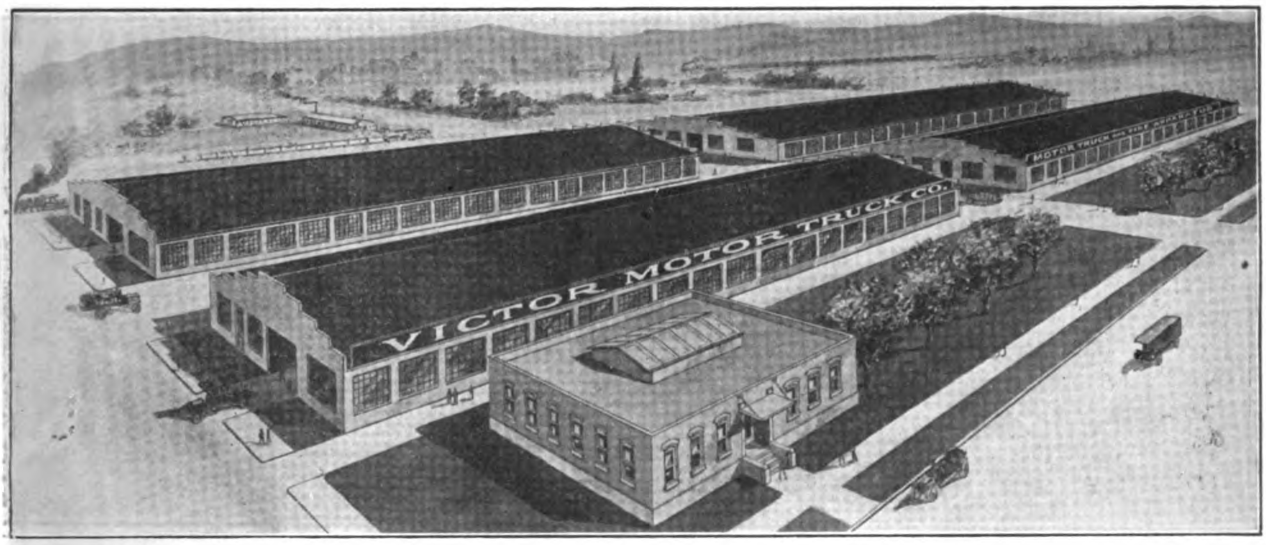
The Knox Automobile Company, Springfield, Mass., maker of Knox cars, is issuing a neat little booklet, entitled "New England Quality," which affords opportunity to call attention to the merits of the concern's product.

W. F. Steel has resigned his position with the Lexington Motor Car Company, Connersville, Ind., but has not announced his future plans.

E. D. Whorley, formerly branch manager of the B. F. Goodrich Company's office in Dallas, Tex., has accepted a position with the Motz Tire & Rubber Company, Akron, O.

The Newark Auto Accessory Company, Newark, N. J., has been incorporated by P. Laible, H. Eisenlohr, S. J. McDonald and G. H. Hupp for the production of accessories and fittings for automobiles. The capital is $100,000.

The Havers Motor Car Company, Port Huron, Mich., announces it has awarded contracts amounting to $340,000 for the construction of motors to be used in Havers six-cylinder cars during the 1912 season.



Architect's Plan of New Plant to Be Erected by the Victor Motor Truck Company of Buffalo N. Y.—One of the Buildings Is Already Completed.

Andy Auble is president, Charles Steels superintendent, and Cecil Walker sales manager of a new concern in Akron, O., organized for the manufacture of a new self-starting device. The company is capitalized for $50,000 and expects to place its product on the market in the near future.

The American Locomotive Company, New York City, maker of Alco cars, has acquired a large piece of property at Long Island City, N. Y., where it will erect a service department.

The International Metal Polish Company, Indianapolis, Ind., maker of Blue Ribbon polishes and other preparations, will erect a new plant 100 by 80 feet on a site recently purchased in that city.

The Willys-Overland Company, Toledo, O., maker of Overland pleasure and commercial vehicles, has been engaged during the past summer in making extensive alterations and additions to the floor space at the factory, bringing it to a total of 60 acres. In the background of the accompanying illustration is shown the large new body building, trimming and paint departments, the structure being four stories high and 300 by 400 feet in dimensions. Other buildings include a new power house, which adds 300 horsepower; a dry kiln with capacity of 1,250,000 feet, and an enamelling plant.

Allerton S. Cushman, Ph.D., formerly assistant director of the United States office of public roads, is now director of the Institute of Industrial Research at 19th and B streets, N. W., Washington, D. C. He is assisted by Prevost Hubbard, consulting chemist, in the examination and testing of road building and protecting materials.

Roy Watts, formerly power apparatus manager for the Western Electric Company, has joined the forces of the Remy Electric Company, Anderson, Ind., as a special travelling sales representative.

The Little Motor Car Company, Flint, Mich., has been incorporated with capital of $1,200,000. The concern will take over the plant of the Flint Wagon Works, which has a capacity of 15,000 cars a year. Among the incorporators appear the names of the following: W. H. Little, Detroit, formerly factory manager of the Buick Motor Company; C. M. Begole, president, and W. S. Bellenger, secretary-treasurer of the Flint Wagon Works.

The Spring Hub Automobile Wheel Company, Cincinnati, O., has been incorporated with capital of $10,000. The new concern will produce a spring hub which is expected to do away with the use of pneumatic tires. No definite arrangements have been perfected as to the location of the plant, although the matter will be taken up at a meeting to be held in the near future.

The National Spring Tire Company has been incorporated in Chicago, Ill., for the manufacture of automobile accessories, etc. The incorporators are: C. J. Sigmann, Jr., L. Valence and C. H. Jackson. The capital is $125,000.

The Metz Company, Waltham, Mass., maker of Metz pleasure and commercial cars, has decided to increase its factory floor space by the erection of a new building.

C. F. Splitdorf, New York City, maker of Splitdorf magnetos, announces that owing to lack of facilities for handling the tremendous volume of business on the Pacific Coast, the San Francisco, Cal., branch has been removed to 430-436 Van Ness avenue. P. E. Kempton will be in charge.

The U. S. Industrial Alcohol Company, 100 William street, New York City, is issuing a neat booklet describing Pyro, a non-freezing alcohol solution marketed by that concern. The composition and effects of different anti-freezing mixtures are dealt with and the advantages of the Pyro alcohol described. A chart and tables are included, showing freezing temperature of solutions of alcohol and water.

Herman of Chicago is the author of a booklet entitled "Ten Tests of an Automobile," which should be helpful to those considering the purchase of a motor car.

The Firestone Tire & Rubber Company, Akron, O., maker of Firestone tires and rims, has experienced a remarkable growth since 1902, when the building shown in the upper left hand corner of the accompanying illustration was erected. That in the upper right hand corner was constructed in 1910, and converted into an exclusive rim plant this year. The main picture shows a general view of the present tire factory.

The Victor Motor Truck Company, Buffalo, N. Y., maker of commercial vehicles ranging from 1500 pounds to 10 tons capacity, is building a new factory, this step being decided upon at a meeting of the board of directors. The present facilities are inadequate for the increasing business. In the accompanying illustration is shown the architect's drawing of the new plant, one building of which is already completed.

N. Lazarnick, automobile photographer, has opened a branch office and studio at 509 South Dearborn street, Chicago. R. V. Cirnveille is manager.

The Henderson Motor Sales Company, Indianapolis, Ind., announces the appointment of the following new agencies, changes, etc., for the Cole line: J. P. McCullom, Carthage, Ill.; Dr. A. J. Thornber, Burlington, Vt.; W. T. Hutcheson, Hempstead, L. I.; Winthrop Pier, El Centro, Cal.; Crist Motor Sales Company, Toledo, O.; Fred and William Chadsey, Cherokee, Kan.; Douglas & Willett,, Harrisonville, Mo.; Anderson Motor Company, Fon

Du Lac, Wis.; Stahl & Stone, Topeka, Kan.; Spencer Auto Company, Spencer, Ia., branch of Cole Motor Company of Des Moines; Breen Motor Company, Winnipeg, Can., removed to 151 Portage avenue; Cole Motor Company, Wichita, Kan., to new quarters at First and Water streets; Penn Auto Company, Scranton, Penn., changed to that of Scranton Auto Company; Marcus R. Thackery, Sterling, Ill., moved to 601 West Third street; Jay E. Morehouse, Milwaukee, Wis., new salesroom at 86 Farwell avenue; Moscow Automobile Company, Moscow, Ida.; C. F. Cole, Denver, Col.; Twitchell Motor Car Company, 15th and Washington streets, Portland, Ore.; Kewanee Garage, Kewanee, Ill.; R. Bruce Carson, Hagerstown, Md.; C. F. Dupree, Atlanta, Ga.

The Baker-Brewer Auto Company, Indianapolis, Ind., agent for the Baker electrics, made by the Baker Motor Vehicle Company, Cleveland, O., has obtained quarters at 426 North Capital avenue.

The Bosch Magneto Company of New York City calls attention to the fact that at the Olympia show, held at London, England, recently, of the 599 magnetos displayed on cars, 488 were Bosch, 81 per cent. of the total. The balance of 19 per cent. was divided among 10 other manufacturers.

Maj. L. M. Fuller and E. H. Sohner of the Velie Motor Vehicle Company, Moline, Ill., were in Chicago recently purchasing machinery equipment for plant No. 2. At this factory motors for both the pleasure and commercial vehicles will be constructed, also the new Velie Junior automobile.

The American Locomotive Company, New York City, has appointed Robert F. Russell assistant engineer of its automobile department. He was identified with the Simplex company for over seven years, having charge of the designing department. In his new capacity he will be associated with Montague H. Roberts, chief engineer, in matters pertaining to Alco pleasure and commercial cars.

Alden L. McMurtry, one of the engineers connected with the Gray & Davis dynamo factory, Boston, is touring Europe with the object of investigating every well known lighting system abroad. He was a member of the Society of Automobile Engineers party which visited England recently.

The Havers Motor Car Company, Port Huron, Mich., announces an increase of capital stock from $60,000 to $200,000. Sanderson & Burkhardt of Buffalo, N. Y., and the Havers Sales Company of Milwaukee, Wis., have been appointed agents.

John Wells, formerly manager of the tire department of the Canadian Rubber Company, Montreal, Can., has resigned to become sales manager for P. Gadbois Company, eastern representative of Cole and E-M-F cars.

Fred S. Howard, manager of the Franklin Square Garage, Worcester, Mass., has plans underway for equipping a new machine shop for the purpose of producing any part needed in the repair of automobiles. This will necessitate the addition of three new men to the present garage force.

Harrison H. Hanley of North Adams, Mass., and Claude Bradford of New Haven, Conn., have purchased the Dill garage on Crown street in the latter city.

E. O. Hoopengarner, chairman of the committee appointed by the Motor Truck Club of New York City to see what could be done toward the establishment of a commercial vehicle garage in the lower part of the city, has secured a promising site on West Houston street.

The Lagerquist Carriage & Auto Company of Des Moines, Ia., has purchased the business of the Sunderlin & Simpson Auto Company of that city, and will conduct both lines, continuing the manufacture of Hawkeye trucks in addition to the operation of a garage.

GARAGE & DEALER

"Doc" Green, formerly sales manager of the Cadillac agency in Los Angeles, Cal., has taken a similar position with the Grundy Motor Sales Company of that city. He will look after the sale of the Cole and Paige-Detroit lines. A. M. Young, who has been sales manager of the Thomas and American cars, handled by the same concern, will retain the same position as heretofore.

The Ernest P. Chesbro Automobile Company, Hartford, Conn., which is building a brick repair shop, has leased the property to Fred M. Little and George Siegrist of that city. The former has been conducting a repair shop while the latter was head mechanic for the Chesbro company.

The Newton-Humphreyville Company, Newark, N. J., has taken over the Pierce-Arrow building at 124 Washington street.

The McManaway Garage has leased quarters in the Wadsworth building, North Tryon street, Charlotte, N. C., and will remodel the structure. The concern is agent for the Marion line.

The Johnson Garage, Forest street, South Norwalk, Conn., has been remodelled. The ground floor will be utilized for storage and the second devoted to the repair shop.

The Acme Motor Company, Worcester, Mass., organized recently to continue the business of D. A. Baldwin, has completed negotiations for the purchase of a four-story building located at 22 Commercial street.

The Gallagher-Tompkins Company, 1876 Broadway, New York City, has taken the agency for Manhattan and Long Island for the Selden line, made by the Selden Motor Vehicle Company of Rochester, N. Y. The former concern is a new addition to automobile row and comprises R. W. Gallagher and F. Bianchi Tompkins, both well known to the automobile trade.

The Hampden Tire & Rubber Company, Holyoke, Mass., has purchased the Richard Riley Auto Company of that city. The new concern contemplates making extensive improvements.

The Macker-Tyler Company, Worcester, Mass., held its annual meeting recently and elected the following officers: President, O. P. Tyler; secretary and treasurer, G. F. Fuller; clerk, Jay Clark, Jr.

The Charleston Motor Sales Company, headed by William Burguson of Detroit, will open salesrooms in Charleston, S. C.

Charles F. Swartz, 4123 Olive street, St. Louis, Mo., has been appointed agent for the Velie line, manufactured by the Velie Motor Vehicle Company, Moline, Ill.

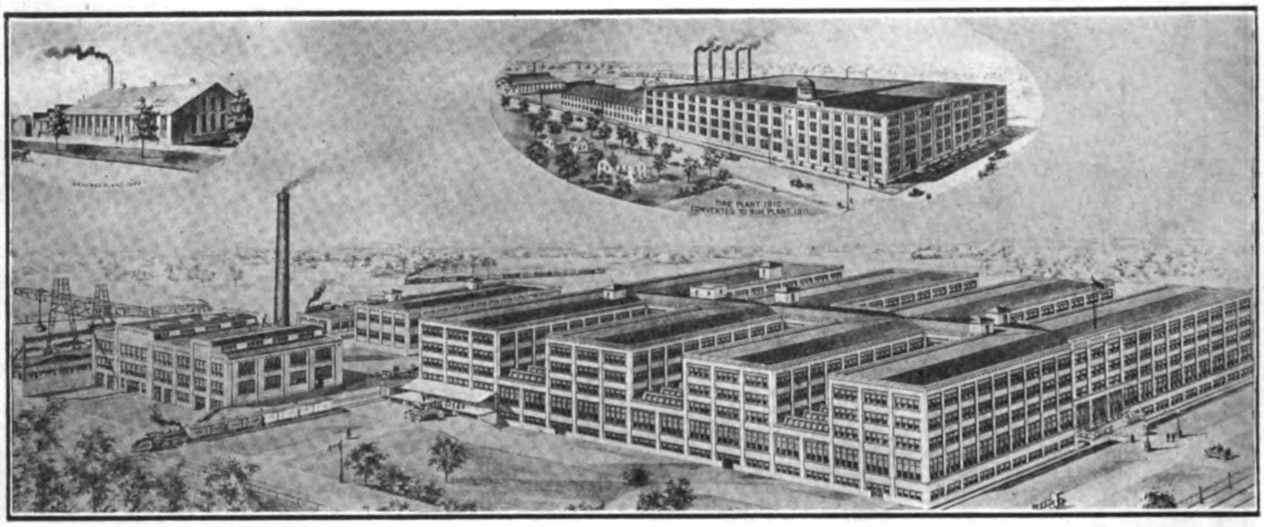
The Missouri State Automobile Directory and Guide for 1911 is now ready for distribution. The book contains road maps, etc.

The Matheson Automobile Company of Wilkesbarre, Penn., has leased the entire building constructed recently on Commonwealth avenue, Boston, and formerly occupied by the Dayton Motor Car Company.

The Auto Sales Company, 1121 Chestnut avenue, Cleveland, O., has taken the agency of the Buckeye truck.

Kirk & Co., New Haven, Conn., has awarded a contract for a new $40,000 garage to be built on Crown street. The building will be equipped with the most modern appliances for the care and maintenance of motor cars.

Peter Porter of Salem and Arthur C. Mayers of Lynn, Mass., have purchased a building on Manning street in



View of the Firestone Tire & Rubber Company's Buildings at Akron, O., Showing the Remarkable Growth of This Concern During the Past Nine Years.

the former city and will open a first class garage which will be known as the Manning Street Garage.

D. J. and W. T. Fox, Birmingham, La., have secured the agency for the Matheson line and will open a new garage at 321 South 20th street.

Volney S. Beardsley, president of the California Automobile Company, Los Angeles, Cal., will erect a garage which will have a frontage on Seventh street. The building will be divided so that the gasoline and electric departments will be entirely separate.

The W. L. Russell Company of Boston has taken the agency for the Haynes car, made by the Haynes Automobile Company, Kokomo, Ind.

The Electric Vehicle Club of Boston has formed a permanent organization. Day Baker, New England manager of the General Vehicle Company, has been elected president, and Leavitt L. Edgar of the Boston Edison Company, secretary.

H. W. Lowe, formerly with the Peerless Motor Car Company's factory at Cleveland, O., has joined the forces of the Fairfield Auto Company, New Orleans, La., as sales manager.

W. C. Poertner has leased a floor in the building opposite the Automobile Club of America on West 54th street, New York City, where he will conduct a maintenance department for National cars sold in that district. It is planned to fit up an entire automobile plant in miniature, and all used cars will be given a thorough overhaul in this shop before being placed upon the market.

The Capital Car Company has been organized in Wheeling, W. Va., for the purpose of representing the K-R-I-T cars, made by the K-R-I-T Motor Car Company, Detroit. It will be located at Chapline and 16th streets.

Charles Childs, George Childs and **William H. Boyington,** all of Pittsfield, Mass., have opened a shop for the vulcanizing and repair of automobile and motorcycle tires at 156 Union street in that city.

David J. Fox and William T. Fox have been appointed general southern selling agents for the Matheson cars, made by the Matheson Automobile Company, Wilkes-barre, Penn., with headquarters at Birmingham, Ala. Their territory will include the States of Alabama, Mississippi and eastern Tennessee.

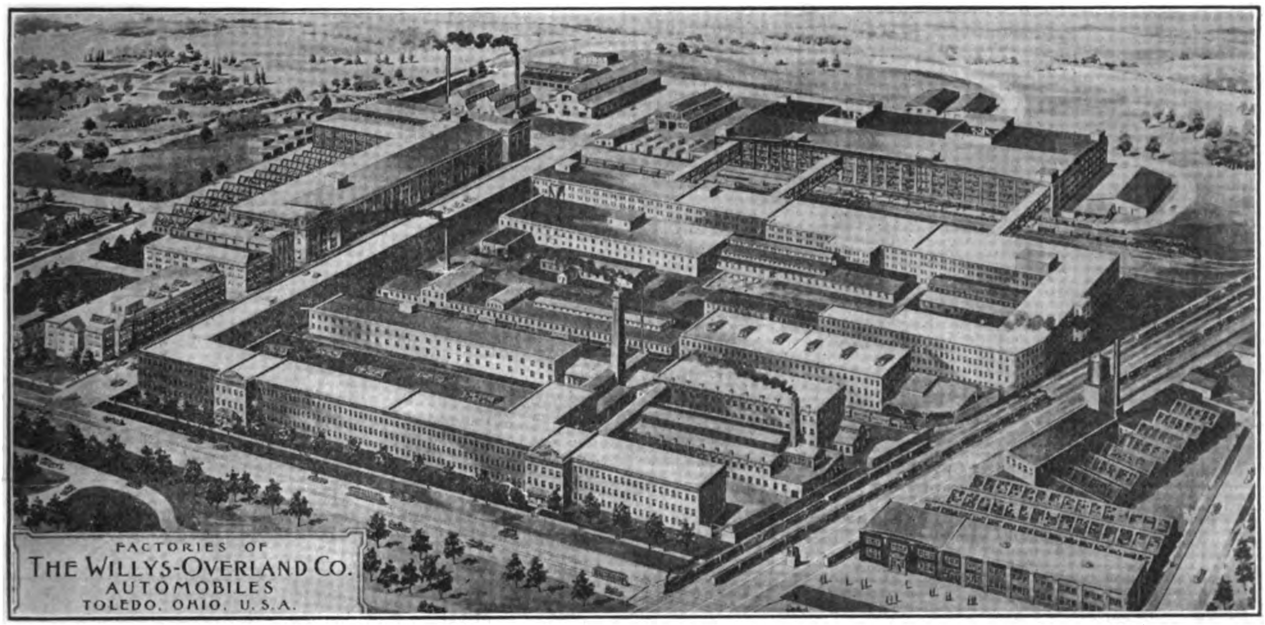
The Oneida Garage Company of 125 Park avenue, Utica, N. Y., is to erect a new building, which is to be the largest and most complete in the city. It is anticipated the new structure will be ready for occupancy soon after the first of the year.

Frank P. Day has been appointed manager of the new branch of the Locomobile Company of America, Bridgeport, Conn., in Atlanta, Ga.

Mohrig Bros. has removed to its new building on Golden Gate avenue, San Francisco, Cal., where it will have all the necessary facilities for carrying on a rapidly increasing business in the sale of automobiles, parts and accessories.

Albert J. Ditman, for the past eight years connected with the Studebaker Corporation, South Bend, Ind., has become a member of the Whiting Motor Company, New York City, agent for Cunningham and Mercer pleasure cars, and Sandusky trucks.

Harry Spencer is remodelling a building on Bridge street, South Hadley Falls, Mass., and will open a garage. He was formerly employed in Springfield as head mechanician.


FACTORIES OF
THE WILLYS-OVERLAND CO.
AUTOMOBILES
TOLEDO, OHIO, U.S.A.

General View of the Largely Increased Plant of the Willys-Overland Company in Toledo, O.

The Poertner Motor Company, New York City, has taken the agency for Herreshoff cars, made by the Herreshoff Motor Company, Detroit.

The Standard Tire & Rubber Company, 104-106 Portland street, Boston, Mass., is making extensive preparations for a largely increased business during 1912. Early in the month, Treasurer J. S. Waddell left on a trip to the Pacific Coast and Hawaiian Islands, and will establish a number of agencies for the firm's products. The name of the concern's uptown branch has been changed from Percy Ford Auto Supply Company to the Standard Auto Supply Company.

George Armstrong, representing Carlos Armstrong, E. Hijos, Plays-Ponce, Porto Rico, on a recent trip to New York City, arranged with the Colt-Stratton Company, eastern distributor for Cole cars, made by the Cole Motor Car Company, Indianapolis, Ind., to handle that product in Porto Rico.

The De Dion-Bouton Selling Branch, 1649 Broadway, New York City, American representative of the Etablissements de Dion-Bouton, France, maker of De Dion-Bouton cars, is issuing a splendidly illustrated catalogue of these machines.

C. H. Voegele, Mansfield, O., has closed a contract with the Velie Motor Vehicle Company's Chicago branch to represent this line of cars in his vicinity.

Studebaker agents of the East, comprising about 200 dealers of New York, New Jersey, Long Island and Connecticut, left New York City recently for a factory inspecion trip in a Flanders and E-M-F Pullman train over the West Shore road. The guests were conveyed from the metropolitan Studebaker branch at Columbus Circle to the ferry by E-M-F cars. In the accompanying illustration is shown the members of the party previous to the start.

C. M. Allen of New York City will succeed K. B. Harwood as manager of the Autocar Company's branch in that city, while the latter will take an exclusive agency for Autocars in Chicago and vicinity.

J. M. Quinby & Co., New York City, has opened a retail agency for Isotta-Fraschini cars at Broadway and 54th street, in that city.

Morton H. Luce, manager of the Velie Chicago branch, has placed Charles V. Severin, who has been connected with the industry for the past seven years, in charge of the Velie service department.

The Central Texas Automobile Company, Taylor, Tex., has filed a certificate of dissolution.

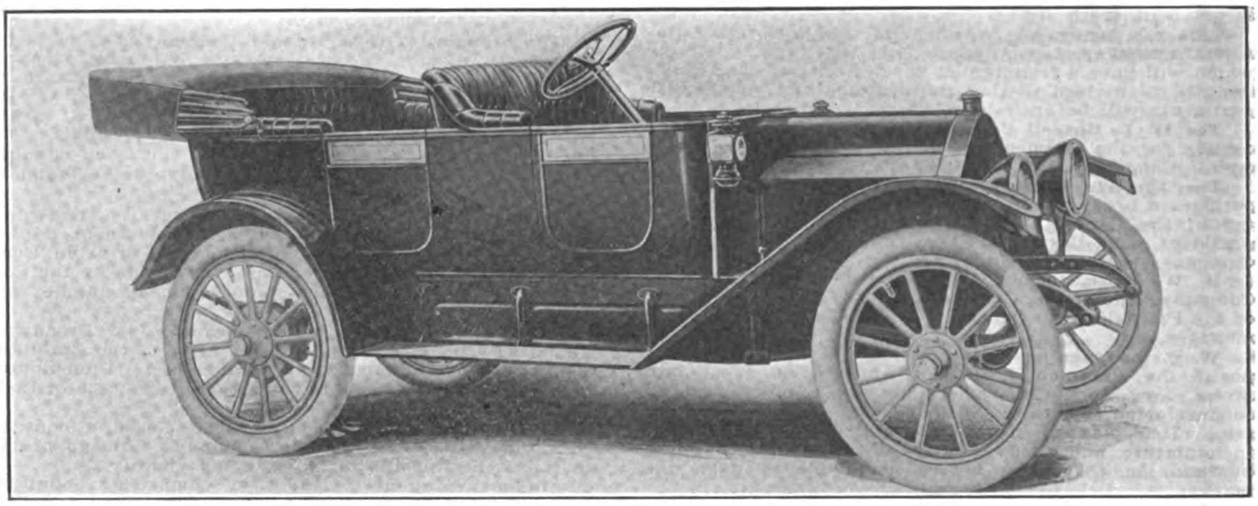
The Clark Motor Car Company, Louisville, Ky., has amended its articles of incorporation, providing for an increase of capital stock from $30,000 to $60,000.

Leslie B. Eaton is president and F. W. Pennebaker secretary of the new automobile company incorporated recently at 1136 West Third street, New York City. The new concern will handle the Marion line of cars.

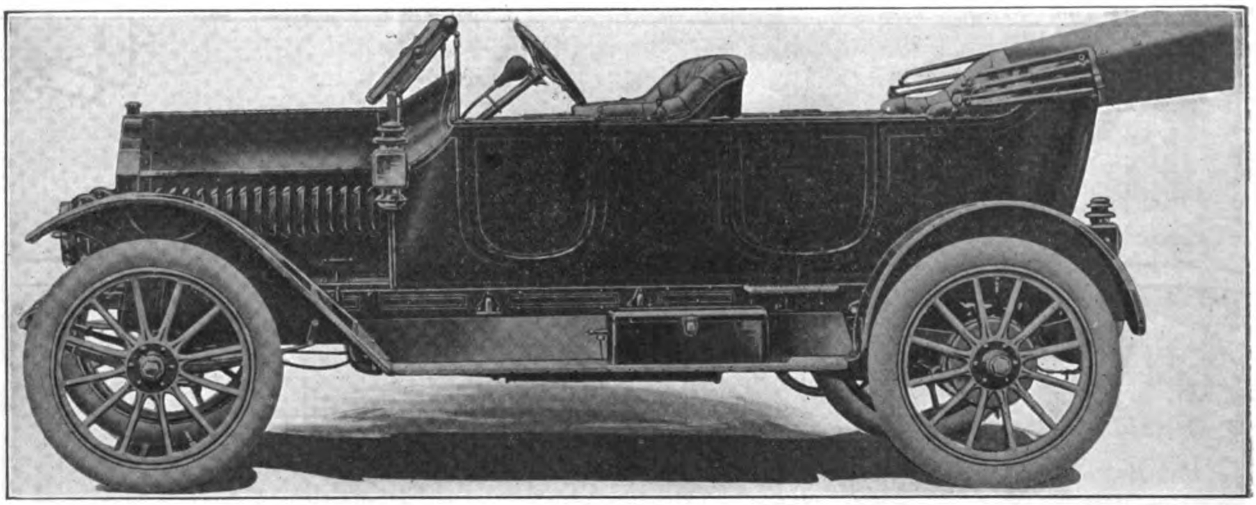
The La France Motor Car Company of Elmira, N. Y., announces that the name has been changed to the La France Garage Company and that the concern has been incorporated.

John E. Boyle, a well known druggist of Fairfield, Conn., will open a new garage in that place Nov. 15. He has leased a large building which is being altered.

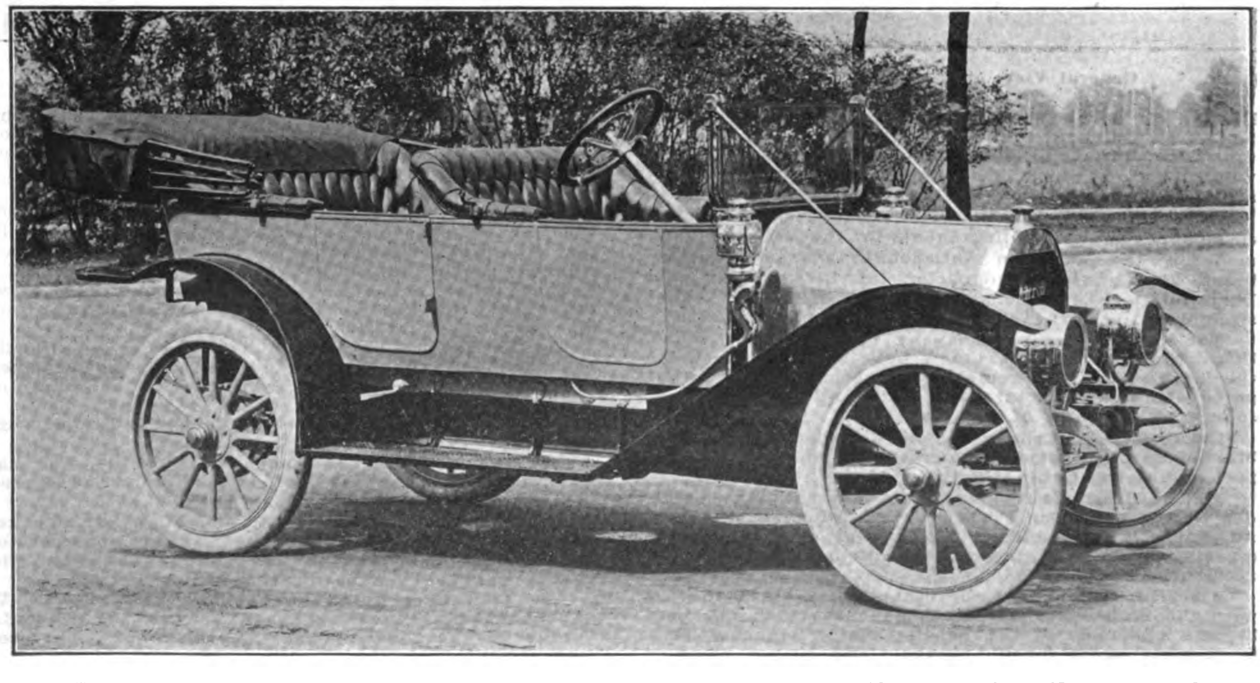
ATTRACTIVE LINES FOR LIVE AGENTS.



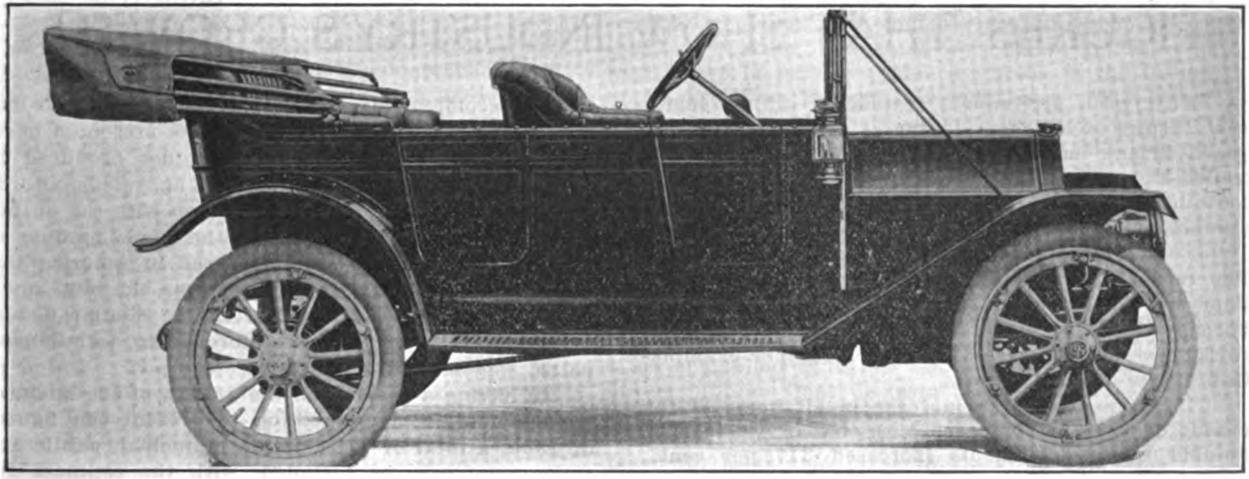
Touring Body Fitted with Detachable Fore Doors, an Especially Desirable Equipment for Great Western Cars, Made by the Great Western Automobile Company, Peru, Ind.



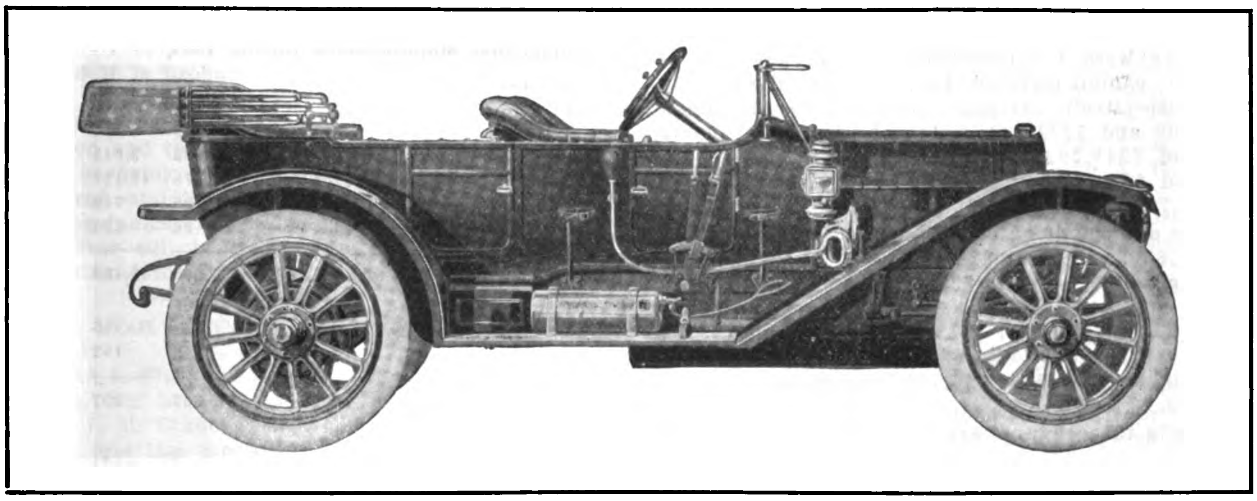
Special Four-Passenger Touring Car Body Known as 99B When Installed on a 40 Horsepower Friction Driven Lambert Chassis, Built by the Buckeye Manufacturing Company, Anderson, Ind.



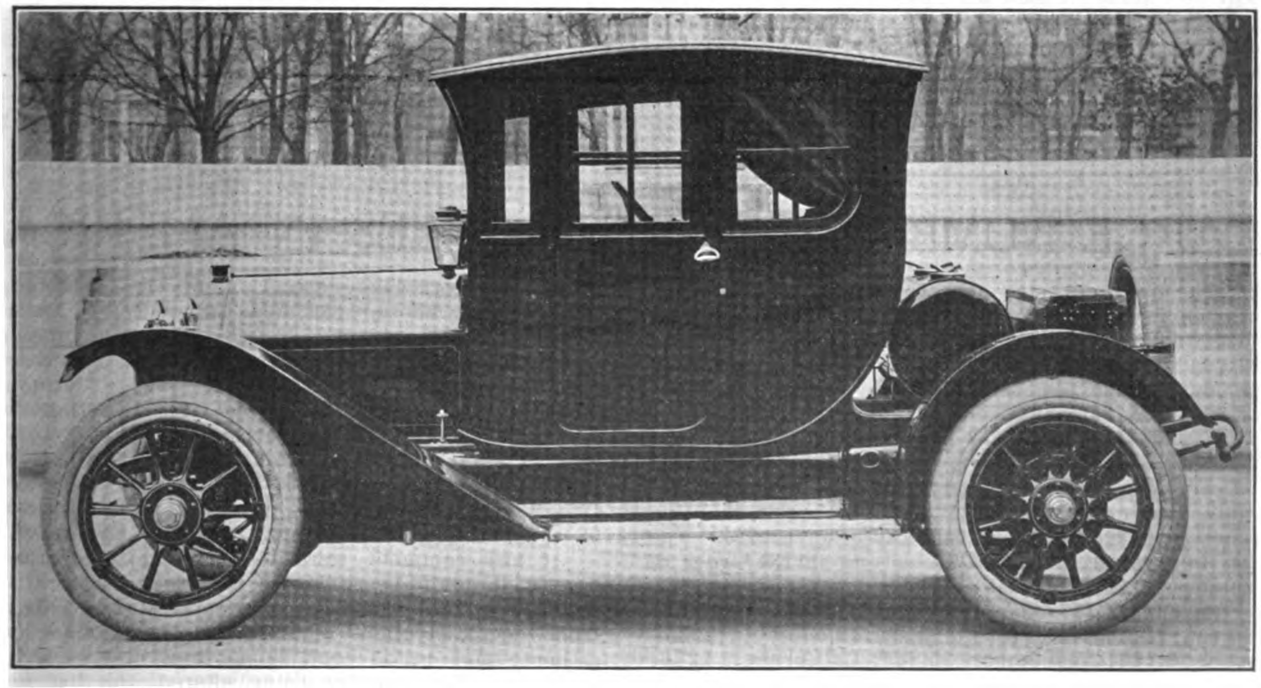
Fore Door Touring Body Designed for 1912 Equipment of Warren-Detroit Cars, Known as Model K-30, the Product of the Warren Motor Car Company, Detroit, Mich.



Model K, the Latest Production in the Way of Body Equipment Turned Out by the K-R-I-T Motor Car Company, Detroit, Mich.



"Thirty" Semi-Touring Model KisselKar, the Smallest of the Line of Machines Built by the Kissel Motor Car Company, Hartford, Wis.



Colonial Coupe Body, Which Is Especially Adapted for Winter Service, Fitted to Stutz Chassis by the Ideal Motor Car Company, Indianapolis, Ind.

FIGURES THAT SHOW INDUSTRY'S GROWTH.

A FURTHER preliminary statement of the general results of the 13th census of establishments engaged in the manufacture of automobiles, including bodies and parts, issued by Census Director Durand, contains summaries, which give in general figures, the number and value of machines by kind for 1904 and 1909, and the horsepower rating by classes for 1909. The report was prepared under the direction of William M. Steuart, chief statistician for manufactures, bureau of census. The figures are subject to such revision as may be necessary after a further examination of the original reports.

The summary shows increase in all items at the census of 1909 as compared with that of 1904. The number of establishments increased 317 per cent.; capital invested, 653 per cent.; gross value of products, 730; cost of materials, 901; value added by manufacture, 596; average number of wage earners employed, 528; amount paid in wages. 580; number of salaried officials and clerks, 682; amount paid in salaries, 654; miscellaneous expenses, 389; primary horsepower, 647.

There were 178 establishments in 1904 and 743 in 1909; capital invested, $23,084,000 and $173,837,000, respectively; average capital an establishment, $130,000 and $234,000; value of products, $30,034,000 and $249,202,000; salaries and wages, $8,416,000 and $58,173,000; average wage earners, 12,409 and 75,721.

The number of automobiles manufactured in 1904 was 22,830, valued at $24,630,400. Of these, 19,837 were gasoline, worth $20,440,100; 1425 electrics valued at $2,496,300, and 1568 steam at $1,688,000. In 1909, the total was 127,289, and the value, $165,115,100, divided as follows: Gasoline, 121,274, $155,068,100; electric, 3639, $6,564,500; steam, 2376, $3,482,500.

While these figures are practically two years old, they offer a satisfactory basis from which to compute the number of cars in actual use in America today. Reliable sources of information, although by no means more authentic than the government census report, fix the product of automobiles in 1910 at 145,000 and that for 1911 at 190,000, with a prediction that 1912 will see at least another 210,000 pleasure vehicles and 18,000 business wagons. Assuming that the rate of increase between 1904 and 1909 was more or less gradual and making due allowance for depreciation, a conservative estimate of the machines now in service would be not far from 525,000.

An accompanying table, issued by the census bureau in connection with the other data presented herein, sets forth the number of machines produced in 1909, classified by horsepower rating. This affords additional opportunity for comparison with the output for 1911. It will be noted that the whole number of taxicabs, for instance, manufactured in America two years ago was 1203. This is less than the total operated in New York City alone today. Similar deductions might be made with reference to ambulances, patrol wagons and other items.

As having a bearing on the growth of the business vehicle field, it is interesting to present the figures of 1909, a total of 4784, if the municipal, public and commercial cars be included, with the estimate for 1912, 18,000. The remarkable strides that have been made in this important branch of the automobile industry within the past two years have few parallels in the business history of the world.

Automobiles Manufactured During 1900, by Horsepower.

CLASS:	Total	Less than 10	10-20	20-30	30-50	50-90	90
Pleasure—							
Buggies....	4,582	482	3,705	339	56	..	..
Runabouts..	36,496	4538	17,818	10,933	3,043	157	7
Tour. cars..	76,433	177	5,415	21,878	46.117	2825	21
Closed......	3,968	1571	855	729	749	63	1
Others......	1,026	449	14	26	523	14	..
Total....	122,505	7217	27,807	33,905	50,488	3059	29
Public—							
Cabs........	1,203	..	627	521	55	..	..
Omnibuses..	225	10	3	16	152	44	..
Total.....	1,428	10	630	537	207	44	..
Municipal—							
Ambulances	32	5	2	6	17	2	..
Patrols.....	36	..	..	6	16	14	..
Total.....	68	5	2	12	38	16	..
Commercial—							
Del. wagons	1,875	264	884	628	98	1	..
Trucks.....	1,401	46	330	297	627	101	..
Others......	12	..	4	1	4	3	..
Total.....	3,288	310	1,218	926	729	105	..
Grand total	127,289	7542	29,657	35,380	51.457	3224	29

LARGE NUMBER OF AUTOMOBILES IN AMERICA.

The question as to how many automobiles are in service in the United States is one which interests every motorist, as having a bearing upon the magnitude of the industry. Of course, any totalization is bound to be largely a matter of estimate, but one of the tire companies in Akron, O., has based its figures on the number of shoes sold during the past year, careful account having been kept of the owners of cars making purchases of this nature. This estimate places the total at 573,696, which is counting much more closely than from any other source. The list follows, according to states and in the order of number of cars in each:

New York, 70,560; Illinois, 52,038; Pennsylvania, 50,703; Ohio, 40,951; Michigan, 40,000; Massachusetts, 39,430; New Jersey, 35,800; California, 33,266; Indiana, 23,000; Iowa, 22,000; Minnesota, 19,561; Missouri, 16,000; Wisconsin, 11,412; Nebraska, 10,212; Connecticut, 9526; Kansas, 8000; Colorado, 7608; Georgia, 6411; Texas, 6200; Rhode Island, 5984; South Dakota, 5462; Washington, 5378; Maine, 4853; New Hampshire, 4324; Oregon, 4100; District of Columbia, 4100; West Virginia, 3575; Tennessee, 3516; Maryland, 3317; Virginia, 3299; Vermont, 3000; Kentucky, 2871; Florida, 1864; Oklahoma, 1786; Montana, 1641; Alabama, 1561; Utah, 1495; South Carolina, 1474; Louisiana, 1440; North Carolina, 1171; Delaware, 1000; Idaho, 924; North Dakota, 840; Arizona, 570; Wyoming, 562; Arkansas, 381; Mississippi, 250; Nevada, 199; New Mexico, 171.

If any comment were to be made upon these figures, it might be suggested that they seem rather under than over the number in some states, judging from the registrations reported. However, since one estimate may be as good as another, and each has some special reason for being offered, the list may prove of interest as a basis on which others may desire to work.

SELLING AUTOMOBILES FOR INSTALLMENTS.

The Studebaker Corporation has adopted a policy in which it will sell E-M-F and Flanders cars and accept payment in installments. This is acceptance of methods that have been the vogue with builders of farming machinery and equipment and which have developed business that would not, in all probability, be immediately realized. The reason stated by General Manager Walter E. Flanders is that the company considered the future rather than the present and believed its policy would prove quite as profitable as it has been for some of the concerns doing a country or world-wide business. The terms of sale that will be acceptable to the company have not been made public. The experiment, if it is regarded as such by the industry, will be observed with unusual interest. The installment plan, however, is not applied to the more expensive cars produced by this company.

WARNER TO MAKE CARBURETORS.

Announcement is made that a carburetor that will probably be known as the Warner is to be placed in the market by the Warner Instrument Company, Beloit, Wis. The preparations for manufacturing are making and it is probable that in a short time the carburetor will be offered for sale. It is stated that the instrument has been experimented for a considerable period and that for it unusual results and decided fuel economy are claimed. It is held that the high standard established by the company in its speed and distance indicators will be maintained, and that the carburetor will be marketed through the same channels utilized for the auto-meters.

F. S. FISH SUCCEEDS STUDEBAKER.

Frederick S. Fish, vice president of the Studebaker Corporation, has become president of the company, succeeding J. M. Studebaker, whose resignation was accepted at the last meeting of the board of directors. While this terminates Mr. Studebaker's activities as head of the company he remains chairman of the board of directors and will continue in the directorate. Clement Studebaker, Jr., is now first vice president and chairman of the executive committee of the board of directors. A. E. Erskine and Scott Brown were continued as treasurer and secretary and general counsel, with Frederick P. Delafield as special counsel. J. N. Gunn is general manager of the company, a new office, with offices at New York, N. Y. He has been a member of the firm of Gunn & Richards, production engineers.

KISSEL COMPANY INCREASES STOCK.

The stock representing the capital of the Kissel Motor Car Company, Hartford, Wis., has been increased from $400,000 to $1,000,000. This has been necessary to provide for the expansion of the business, both in manufacturing and marketing. The additions to the factory now making include a building 107 by 407 feet, three stories in height, and a single story structure 50 by 407 feet. These will afford 150,767 square feet, or nearly three and a half acres of floor space that will be available for manufacturing. The factory equipment will include a trolley line for the transportation of material about the works. The buildings will be ready for occupancy by the first of the year.

FLOATING TYPE AXLE NOT INFRINGED.

The withdrawal of the suits alleging infringement of patent instituted against the National Motor Vehicle Company of Indianapolis, Ind., by Thomas J. Lindsay and Willard Harmon, who claimed to be holders of basic patents, establishes that there is not in this country a patent that controls the manufacture of this type of axles. The suits were begun in 1905 and were heard in part by Judge Anderson in the United States Court at Indianapolis last June. The action disposing of the suits is claimed to be a conclusion reached by all persons at interest that the patents relied upon had been anticipated by the English patent granted to Elliott in 1893.

SALE OF CARS NOT INTERSTATE COMMERCE.

The contention that the sale of automobiles was interstate commerce and that as such a business was not amenable to the Pennsylvania statute imposing a tax of one per cent. has been decided by the United States Supreme Court in favor of the state authorities, who had endeavored to collect the tax from the Banker Brothers' Company, Pittsburg. The company was taxed for sales amounting to $351,000 and after the state courts had decided adversely to it carried the cause to the highest tribunal.

BUYS NEW FACTORY PROPERTY.

The Briggs-Detroiter Company, Detroit, Mich., has acquired about two acres of land and the buildings thereon at Hamtramck, in that city. The property was owned by the Reinforced Concrete Pipe Company, but the structures had never been used. The leaders of the company are Claude S. Briggs, president of the Detroit Dental Company, and John A. Boyle, vice president of the Brush Runabout Company. It is stated that the company is to equip the factory as rapidly as this can be accomplished, and manufacturing will be begun as soon as possible.

DEMOTCAR PLANT CHANGES HANDS.

The plant of the Demotcar Company, Detroit, has been acquired by C. H. Ritter, R. A. Skinner and A. W. Voege, who will manufacture a four-cylinder runabout which will have a motor with bore of 3.25 inches and stroke of 3.37 inches. The car will have a multiple disc clutch and two forward speeds and reverse selective type transmission. The wheelbase will be 90 inches. The machine will be sold completely equipped.

METZGER COMPANY SELLS BONDS.

An issue of bonds drawing interest at six per cent., $5000 maturing May 1, 1912; $15,000 maturing June 1, 1912, and $15,000 maturing July 1, 1912, has been sold by the Metzger Motor Car Company, Detroit. The bonds are secured by a first mortgage on the company's property.

McCORD COMPANY ENLARGING.

The business of the Precision Appliance Company, Chicago, Ill., has been acquired by the McCord Manufacturing Company, which will continue the manufacture of Hill precision oilers in connection with McCord oilers at Detroit. The facilities of the McCord company have been considerably increased.

NEW BUILDING FOR CHALMERS COMPANY.

A building of brick and steel, two stories, 75 by 180 feet, is being erected at the Chalmers Motor Company's plant, Detroit, this expansion being made necessary by the increased volume of work.

Victor Hemery, the racing driver with fame on both continents, is expected to associate himself with the J. I. Case Threshing Machine Company, Racine, Wis., as consulting engineer and supervisor of the racing team that concern expects to maintain to exploit Case cars.

TRADE AND FACTORY ACTIVITIES IN OHIO.

Works Busy and Products in Large Demand With the Manufacturers in This State.

The Schacht Motor Car Company, Cincinnati, has engaged E. W. Arbogast, formerly general manager of the De Tamble Motor Company, Anderson, Ind., as manager of its Chicago branch.

A meeting of the stockholders of the Miller Rubber Company, Akron, was held Dec. 15 for the purpose of increasing the capital from $500,000 to $1,000,000.

Business is very lively at all of the Akron rubber factories and it is expected that 2000 workers will be added to the 17,000 now employed in these works for the winter.

The capital of the Sandusky Auto Parts and Motor Truck Company, Sandusky, has been increased from $150,000 to $500,000. The organization is with A. F. Knotts as president and R. D. Mitchell as secretary.

A new battery department has been created at the works of the Apple Electric Company, Dayton, which is to produce storage batteries for electric lighting systems and all general purposes as well as motor vehicles and power boats.

Ordered 50 Electric Wagons.

The American Express Company has ordered 50 electric delivery wagons from the Baker Motor Vehicle Company, Cleveland, to be delivered as early as is possible.

A factory of the Electric Auto-Lite Company, Toledo, is being equipped with machinery and will shortly be operated.

The Universal Machine Company has removed from Toledo to Bowling Green, where it occupies a new factory having 22,000 square feet of floor space, where it will build motors and later automobile parts.

A considerable quantity of stock and equipment of the Norwalk Motor Car Company has been sold by the receiver in bankruptcy to the Model Gas Engine Company, Peru, Ind.

New Plant Will Employ 150.

The new plant of the American Tire & Rubber Company at Akron, which will produce tire tubes and repair stock and employ 150 hands, will be in operation before the end of the year. The company has these officers: President and treasurer, Adam Duncan; vice president, Gilbert C. Waltz; secretary, F. L. Kryder; directors, Adam Duncan, Gilbert C. Waltz, F. L. Kryder, Harvey Musser, Gustavus Sieberling, C. M. Wertz, Frank Miller, L. C. Henderson and L. C. Rowe.

The new plant of the Warner Manufacturing Company, Toledo, which has 100,000 square feet of floor space and employs 1000 men to increase its facilities, is being operated day and night. The factory has a capacity of from 40,000 to 50,000 transmissions and steering gears annually.

Receiver of Mansfield Company.

S. P. Ward of Mansfield has been appointed receiver of the Mansfield Rubber Company, engaged in the manufacture of automobile tires, which has been adjudged a bankrupt at Cleveland. The concern is capitalized at $25,000.

A committee of stockholders has been appointed to consider proposals made to purchase the Howard Motor Company of Galion, and to dispose of the business as is deemed best.

The Union Motor Car Company has made arrangements to produce a two-passenger runabout of low price which will be known as the Union 25 at the works of the Dunlap Engineering Company, Columbus. J. W. O'Brien of Nashville is the head of the concern, which will be, it is proposed, capitalized for $500,000.

The K-W Ignition Company's new factory at Cleveland is completed and will be occupied the present month. It is 165 by 75 feet, four stories, of steel and concrete construction, and is practically fire proof.

With capital of $50,000 the Dunlap Manufacturing Company has been organized at Columbus, O., to manufacture automobile parts and pneumatic tools, by S. H. Dunlap, T. C. Dunlap, L. F. Sater, B. G. Watson and A. N. Schetenstein.

The Firestone Tire & Rubber Company, Akron, has appointed A. G. Partridge as its assistant sales manager.

Now Has Chicago Branch.

The Standard Welding Company, Cleveland, has established its branch at Chicago, Ill., to succeed an agency, which is in charge of A. C. Clark and B. A. Quayle, from which Illinois, Wisconsin, Iowa, Missouri, Indiana and other states will be served.

Frank L. Sessions, graduate of the Worcester Polytechnic Institute, class of '89, a member of the American Institute of Electrical Engineers and of the American Society of Mechanical Engineers, has been made superintendent of the Standard Welding Company, Cleveland.

The product of the O'Neil Tire Protector Company, Akron, is now marketed by Harry Israel, who is located at 1806 Euclid avenue, Cleveland.

Big Goodyear Dividend.

The Goodyear Tire & Rubber Company, Akron, has declared an annual dividend of 12 per cent. on its common stock, payable Jan. 1. It is stated that the company has earned more than 50 per cent. on its common stock.

The agents for the Speedwell trucks were recently in convention for two days at the factory at Dayton, O., where they were given special information relative to the trucks and instructed in systematized selling methods.

Representatives of the Baker Motor Vehicle Company, industrial department, met at the factory at Cleveland recently, and for three days studied the wagons and trucks in process of manufacture and received instruction in selling methods approved by the company.

The Standard Top and Equipment Company, Cleveland, has passed into the control of W. J. Collins, A. P. Fishley and G. H. Wintenberg, who have been named president, vice president and secretary-treasurer respectively. The concern is capitalized for $15,000.

MOTORETTE COMPANY FAILS.

Because of the objection of one of the largest creditors to a proposition for reorganization the C. W. Kelsey Manufacturing Company, Hartford, Conn., has been petitioned into insolvency by Lawrence A. Howland, acting for a committee of creditors. The property of the company was attached the same day by a creditor. Whether the creditors will arrive at a conclusion that will permit the company to continue is uncertain. C. W. Kelsey, head of the company and designer of the motorette that has been manufactured, was for several years associated with the Maxwell-Briscoe Motor Company, and later was connected with the Columbia division of the United States Motor Company. While a student at college he constructed a three-wheeled motor car that was entirely practical, and being convinced of the practicality of this type of machine he organized the company to build and market his creation.

H. E. Steinbock, for a considerable period connected with the engineering department of the Maxwell-Briscoe Motor Company, the Brush Runabout Company and the United States Motor Company, is organizing a company to manufacture a car of his own design.

WITH THE ILLINOIS MANUFACTURERS.

Developments and Changes Among the Makers of Cars and Accessories.

The engineering force of the Stromberg Motor Devices Company has been augmented by E. A. Besson, recently with the American-La France Fire Engine Company, and prior to that with the Thomas and Stevens-Duryea companies.

The Emil Grossman Company has abandoned its Chicago branch and its products are now marketed in that city and vicinity by the Empire Auto Top & Supply Company, 1219-21 Michigan avenue.

J. W. Fulton has purchased the interest of F. W. Grubb in the Fulton-Grubb Company, factory sales agent at 1146 Michigan avenue, Chicago, and will continue the business.

The Velie Motor Vehicle Company, Moline, has taken over the business of the Velie Motor Car Company, Chicago, and will continue it as a branch establishment under the management of Morton H. Luce.

Authority to transact a general business in Illinois in automobile vehicles has been granted to the Studebaker Corporation of America, which has Illinois capital of $100,000.

Will Build Mogul Tractors.

The Mogul Motor Truck Company has been organized at Chicago to engage in a general business of manufacturing and selling power vehicles. The company has a capital of $125,000 authorized. The incorporators are John P. Hicks, Frank Dawson, George Griffith and L. S. Jones.

An automatic air pump or compressor is to be the principal production of the Acme Automatic Tire Pump Company, which has been organized at Chicago under Illinois law by Francis J. Hoolihan, Emil Rosenthal and Francis J. Carroll. The company has authorized capital of $50,000.

Electrical supplies will be manufactured by the Perfection Storage Battery Company, which has been organized at Chicago with capital of $50,000 by J. W. Hake, G. B. Lyons and C. E. Winters.

To Produce Accessories.

Automobile accessories will be produced by the National Spring Tire Company, incorporated at Elgin by C. H. Jackson, L. Valence and C. L. Siggman, Jr., all of Chicago, with capital of $125,000.

Babbitt and other metal castings will be manufactured by the National Brass Foundry Company, which has been incorporated at Chicago by G. McGuire, H. G. Decker and J. Prince.

Industrial power wagons will be built by the Stevens Motor Truck Company, which has been incorporated at Chicago by A. M. Stevens, L. F. Stevens and G. P. Stevens with capital of $60,000.

The Chicago office of Findeisen & Kropf Manufacturing Company, maker of the Rayfield carburetor, has now the service of F. H. Quick, formerly with the United States Motors Indianapolis Company.

The Paris Electric Starter Company has been organized at Paris, with Carl Farnham president, F. Fishback vice president, Chester Showalter secretary, and P. P. Shutt treasurer. The company will manufacture an electric starting device invented by Mr. Farnham.

The citizens of Christman are considering a proposition to raise $100,000 to invest in the Rayfield Motor Car Company as an inducement for that concern to remove to Christman from Springfield.

Robert M. Barker, who has assumed charge of the advertising of the Chase Motor Truck Company, Syracuse, N. Y., was assistant advertising manager and chief of the copy division of Swift & Co., Chicago, and has been connected with several New York agencies. He has had a diversified experience.

The Sternberg Manufacturing Company, Milwaukee, Wis., has delivered to a Chicago purchaser a truck with a six-cylinder 80 horsepower motor and having a capacity of eight tons.

Brandenberg & Co., with offices in New York, Chicago and Detroit, has become general sales agents for the Buda Company, Harvey, Ill., maker of motors, transmissions and automobile parts.

GATHERED FROM ALL POINTS.

A branch of the Goodyear Tire & Rubber Company has been established at 134-36 Oneida street, Milwaukee, Wis., under the management of H. P. Zeigler.

An amendment to the articles of incorporation of the Mitchell-Lewis Company, Racine, Wis., has increased the number of directors of that concern from 10 to 16.

A new engine, the invention of Julian Brown, is shortly to be produced commercially at Syracuse by a company headed by the inventor. He is a son of A. T. Brown, head of the Smith Premier Company, and of the Brown-Lipe Company, and of the Brown-Lipe-Chapin Company, who was for a long time one of the largest stockholders of the H. H. Franklin Manufacturing Company.

A branch factory of the Dowagiac Motor Car Company, Dowagiac, Mich., at Tulsa, Okla., is being equipped and should be ready for operation by the first of the year.

The factory of the B. F. Board Motor Truck Company, Alexandria, Va., is to be increased substantially by the erection of a new building.

Work has been begun on the new factory structure for the Kline Motor Car Company at Richmond, Va. The buildings will cost approximately $300,000 to erect.

New machine facilities are being added to the plant of the Morrow Manufacturing Company, Elmira, N. Y., which produces automobile and other special parts.

A single story brick addition is being made to the factory of the Niagara Gasoline Motor Company at Barton and Breckenbridge streets, Buffalo, N. Y.

The Matheson Automobile Company, Wilkesbarre, Penn., now has the service of G. S. Delaney as factory manager.

The Continental Car and Equipment Company, Louisville, Ky., has produced a truck of 7000 pounds capacity, which is to be manufactured in considerable numbers at a place to be decided upon shortly.

The Marathon Motor Works, Nashville, Tenn., has purchased the property of the Carbon & Oil Company for the purpose of increasing its plant and has increased its capital to $1,000,000. It is proposed to install about $225,000 worth of machine equipment and to have facilities for producing about 3500 cars annually.

The manufacture of a car to be known as the Moro is to be begun at Los Angeles, Cal., by a company headed by J. J. Morrow and James R. Fouche. A factory building has been leased and machine equipment has been installed preparatory to manufacturing.

The business of the Electric Vehicle Company, Louisville, Ky., has been bought by the Kentucky Wagon Company of that city, and it is proposed to produce all types and sizes of electric conveyances from 1000 to 7000 pounds capacity. This department is in charge of H. Hewitt, who was manager of the Electric Wagon Company.

The Walter Motor Truck Company has succeeded to the business of W. Walter at 49-51 West 66th street, New York, N. Y., and it is intended to erect a factory and garage and produce Walter trucks in considerable numbers. The company has $100,000 capital.

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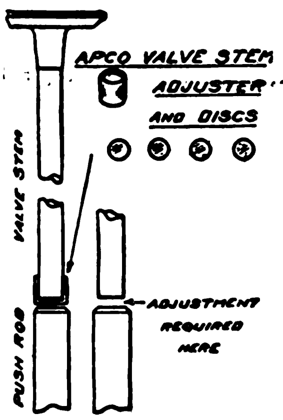

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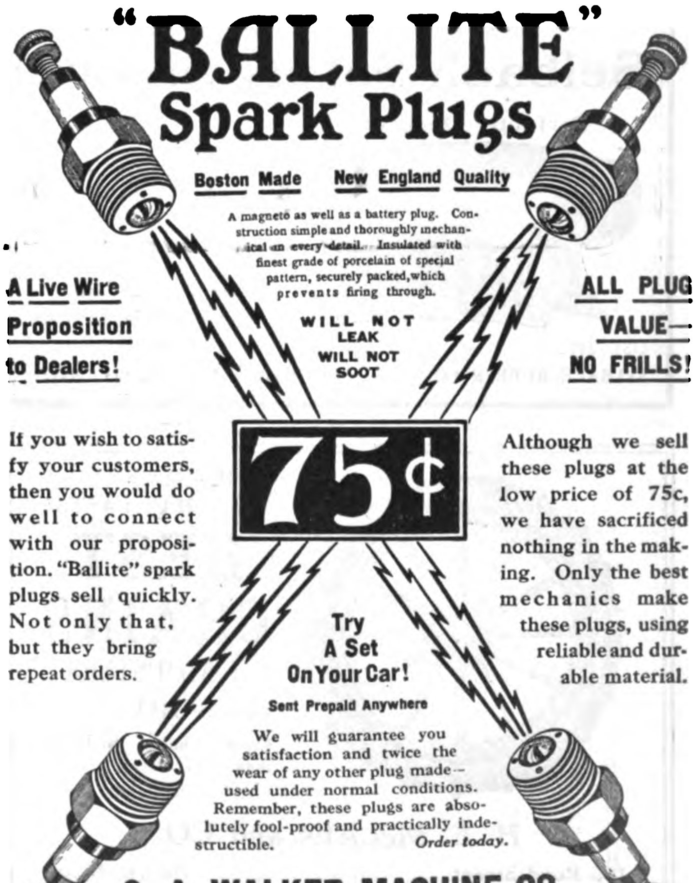

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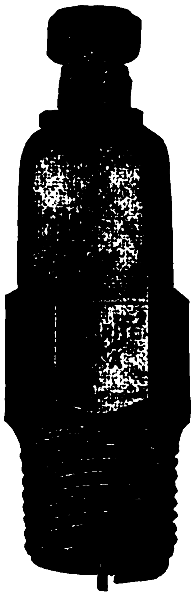

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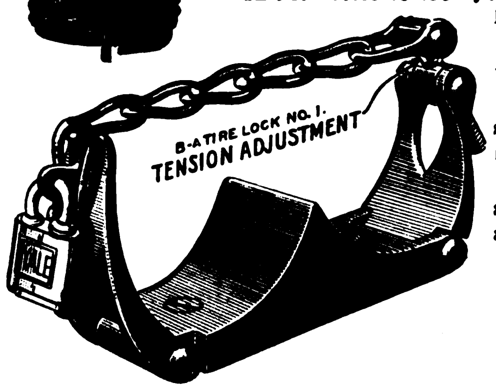

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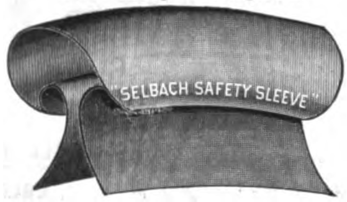

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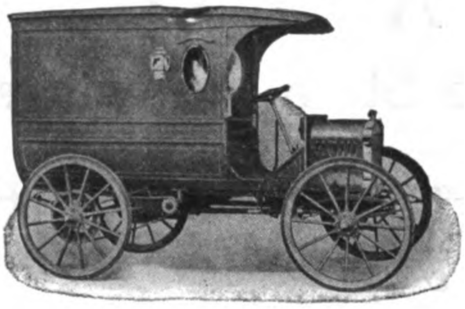

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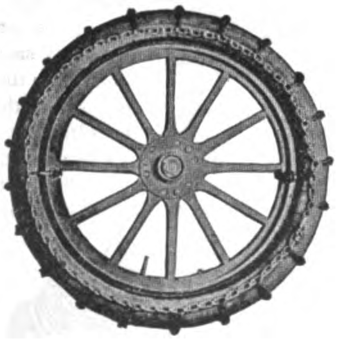

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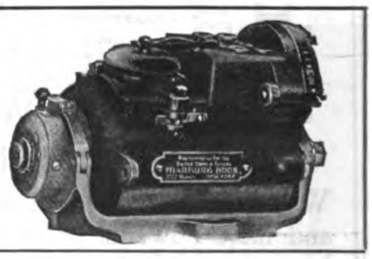

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Miller, Chas. E., 97-103 Reade St., New York City. **Branches:** 202-204 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York City; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia, Penn.; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 136 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence, R. I.

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Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

BRAKES AND HUBS FOR MOTORCYCLES AND BICYCLES.

Corbin Screw Corporation, New Britain, Conn. (Duplex.)

BRAKES FOR PLEASURE AND COMMERCIAL CARS.

Royal Equipment Co., The 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARS—GASOLINE PLEASURE.

Abbott Motor Co., 605 Waterloo St., Detroit, Mich. (Abbott-Detroit.)

American Motors Co., Indianapolis, Ind. (American.)

Atlas Motor Car Co., 104 Birnie Ave. Springfield, Mass. (Atlas.) **Branch:** N. E. corner Broadway and 64th St., New York City.

Berkshire Auto Car Co., Pittsfield, Mass. (Berkshire.)

Brush Runabout Co., 61st St. and Broadway, New York City. (Brush runabout, Liberty-Brush.)

Buckeye Mfg. Co., Anderson, Ind. (Lambert.)

Cameron Car Company, Beverly, Mass. (Cameron.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)

Cole Motor Car Co. See Henderson Motor Sales Co.

Columbia Motor Car Co., 61st St. and Broadway, New York City. (Columbia.)

Corbin Motor Vehicle Corp., New Britain, Conn. (Corbin.)

Dayton Motor Car Co., 61st St. and Broadway, New York City. (Stoddard-Dayton.)

Ford Motor Co., Detroit, Mich. (Ford.)

Great Western Automobile Co., Peru, Ind. (Great Western.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Sales Co., Indianapolis, Ind. (Cole.) **Eastern Distributors:** Colt-Stratton Co., Broadway at 68th St., New York City.

Herreshoff Motor Co., 620 Harper Ave., Detroit, Mich. (Herreshoff.)

Hupp Corporation, 107 Lycaste St., Detroit, Mich. (R. C. H.)

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.) **Branches:** Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis, Ind. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Inter-State Automobile Co., Dept. N, Muncie, Ind. (Inter-State.) **Branch:** 153 Massachusetts Ave., Boston, Mass.

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.)

Lexington Motor Car Co., Connersville, Ind. (Lexington.)

Marquette Co., The, Detroit, Mich. (Marquette.) **Branches:** New York City, Chicago, Boston.

Maxwell-Briscoe Motor Co., 61st St. and Broadway, New York City. (Maxwell.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis, Ind. (National.)

BUYERS' GUIDE---Continued

Oakland Motor Car Co., 1300 Oakland Ave., Pontiac, Mich. (Oakland.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Renault Freres Selling Branch, Broadway and 57th St., New York City (Renault.)
Branches: 1606 Michigan Ave., Chicago, Ill.; 116-120 Van Ness Ave., San Francisco, Cal.; Motor Mart, Boston, Mass.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City. (Sampson 30.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit, Mich. (E-M-F, Flanders.)

United States Motor Co., Broadway and 61st St., New York City (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC PLEASURE.

Waverley Co., The, 172 South East St., Indianapolis, Ind. (Waverley.)

CARS—STEAM PLEASURE.

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Brush Runabout Co., 61st St. and Broadway, New York City. (Brush.)

Cameron Car Co., Beverly, Mass. (Cameron.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Decatur Motor Car Co., Decatur, Ind. (Decatur.)
Branch: Eastern, 20 Green St., Boston, Mass.

General Motors Truck Co., Detroit, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Renault Freres Selling Branch, Broadway and 57th St., New York City (Renault.)
Branches: See Cars — Gasoline Pleasure.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City (Sampson.)

Standard Motor Truck Co. of N. E., 9-11 Harcourt St., Boston, Mass. (McIntyre.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., Broadway and 61st St., New York City (Sampson, Brush, Stoddard.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

General Vehicle Co., Long Island City, N. Y. (G. V.)

Waverley Co., The, 172 South East St., Indianapolis, Ind. (Waverley.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 2754 Rhode Island Ave., Detroit, Mich. (Sampson.)

United States Motor Co., Broadway and 61st St., New York City (Sampson.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CHAINS, TIRE.

Atlas Chain Co., 34 35th St., Brooklyn, N. Y. (Atlas.)

McLain & Co., H. E., 165 Pond St., Natick, Mass.

CHAINS — TRANSMISSION OR DRIVING.

Hoffnung & Co., S., Ltd., 118 Broad St., New York City (Coventry.)

Miller, Chas. E., 97-103 Reade St., New York City (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES — AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CONNECTORS AND TERMINALS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tanks for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

HEATERS, BRICKETTES, ETC.

Chicago Flexible Shaft Co., 132 La Salle Ave., Chicago, Ill. (Duchess and 7X Heaters; Clark Carbon brickettes.)

HORNS—BULB, ELECTRIC, EXHAUST.

Automobile Supply Mfg. Co., 220 Taaffe Place, near DeKalb Ave., Brooklyn, N. Y. (Newtone.)

Randall-Faichney Co., Boston, Mass. (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.
Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

LIGHTING EQUIPMENT — ELECTRIC.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

Esterline Company, The, La Fayette, Ind. (Matchless.)
Branches: Detroit, Mich.; San Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 810½ Chapel St., New Haven, Conn.

BUYERS' GUIDE---Continued

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York City.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Bretz Co., J. S., 250 W. 54th St., New York City (U. & H.)

Connecticut Telephone & Electric Co., 10 Britannia St., Meriden, Conn.
Branches: 819-A Boylston St., Boston, Mass.; 1783 Broadway, New York City; 1146 Michigan Ave., Chicago, Ill.; 544 Van Ness Ave., San Francisco, Cal.; 1518 Broadway, Denver, Col.; 510-511 Majestic Bldg., Detroit, Mich.; 12 So. Eighth St., Minneapolis, Minn.

Herz & Co., 295 Lafayette St., New York City (Herz.)

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

Marburg Bros., 1777 Broadway, New York City (Mea.)

Simms Magneto Co., 1780 Broadway, New York City.
Works: Bloomfield, N. J.

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: 1679 Broadway, New York City; 1110 South Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-436 Van Ness Ave., San Francisco, Cal.; 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MOTORCYCLES AND MOTORCYCLE SUPPLIES.

American F. N. Co., Boston (F. N.)
Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

International Automobile Association, Shelden M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 122 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

OILS, GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)
Branches: Boston, Mass.; Fall River, Mass.; Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)
Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.)
Branch: 66 Wabash Ave., Chicago.

Havoline Oil Co., 133 William St., New York City (Havoline.)

Haws, Geo. A., 77 Pine St., New York City. (Panhard.)
Branch: 899 Boylston St., Boston, Mass.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)
Branch: 284 Columbus Ave., Boston, Mass.

Kincaid Oil Co., 219-221 West Exchange St., Providence, R. I. (Kincaid.)

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York City (Monogram.)
Branches: 126 Massachusetts Ave., Boston, Mass.; 423 Passaic Ave., East Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)
Branches: In all cities.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston, Mass.; 605 Brown Bros. Bldg., Philadelphia, Penn.; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., 80 Broad St., New York City (Wolverine.)
Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.: 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE GUNS.

Randall-Faichney Co., Boston, Mass. (B-Line.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

PUMPS—HAND AND ENGINE OPERATED.

Bridgeport Brass Co., 124 Crescent St., Bridgeport, Conn. (Atlas.)

RIMS — REMOVABLE AND DETACHABLE.

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

Michelin Tire Co., Milltown, N. J.
Branches: Boston, Mass.; Buffalo, N. Y.; New York City; Philadelphia, Penn.; Cleveland, O.; Chicago, Ill.; Detroit, Mich.; Denver, Col.; San Francisco, Cal.; Seattle, Wash.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Connecticut Shock Absorber Co., 10 Britannia St., Meriden, Conn.
Branches: See Magnetos and Magneto Supplies.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

SOAPS.

Hopewell Brothes, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York City.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Herz & Co., 295 Lafayette St., New York City (Bougie Mercedes.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Mac-Kae Manufacturing Co., Boston, Mass. (Mac-Kae.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Walker Machine Co., G. A., 83 Braintree St., Allston Station, Boston, Mass. (Ballite.)

SPARK PLUG TERMINALS.

Mac-Kae Mfg. Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORDING DEVICES.

Casgrain Speedometer Co., 172 Columbus Ave., Boston, Mass.
Branches: 1919 Broadway, New York City; 2031 Euclid Ave., Cleveland, O.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York City; 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)
Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City: 1211 Woodward Ave., Detroit, Mich.: 307 Golden Gate Ave., San Francisco, Cal.; 1212 South Main St., Los Angeles,

BUYERS' GUIDE---Concluded

Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 870 Woodward Ave., Detroit, Mich.; 330½ North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis, Mo.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Ideal Oil & Pump Tank Co., 146 Summer St., Boston, Mass.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Ignition Co., 2829 Chester Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Consolidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-Springfield.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Detroit, Mich.; Cincinnati, O.; San Francisco, Cal.; Los Angeles, Cal.; Akron, O.

Empire Tire Co., Trenton, N. J.
Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia, Penn.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Goodyear Tire & Rubber Co., Griswold St., Akron, O. (No-Rim-Cut.)
Branches: In principal cities.

Michelin Tire Co., Milltown, N. J.
Branches: See Rims—Removable and Detachable.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRE CHAIN GRIPS.

Atlas Chain Co., 34 35th St., Brooklyn, N. Y. (Atlas.)

TIRE INFLATING TANK.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PROTECTORS.

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. (Slikup.)

Michelin Tire Co., Milltown, N. J. (Mastic.)
Branches: See Rims, Removable and Detachable.

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Chicago, Detroit, Kansas City.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tire Casings and Inner Tubes.

Consolidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-Springfield.)
Branches: See Tire Casings and Inner Tubes.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Michelin Tire Co., Milltown, N. J.
Branches:. See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York City.
Branches: See Rims—Removable and Detachable.

TIRE SLEEVES.

Selbach Rubber Co., 404 Atlantic Ave., Boston, Mass. (Selbach Safety.)

TIRE TOOLS AND REMOVING EQUIPMENT.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York City.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Lansing Co., formerly Lansing Wheelbarow Co., Lansing, Mich.
Branches: Factory, Parkin, Ark.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Pitless Auto Turntable Co., Kansas City, Mo.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, Hartford, Conn. (Kant-Break.)

VALVE DRESSERS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y.

VALVE STEM ADJUSTORS.

Auto Parts Co., Motor Ave., Providence, R. I. (Apco.)

VARNISHES FOR AUTOMOBILE BODIES.

U-Auto-Varnish Co., Cleveland, O.
Branch: 218 Columbus Ave., Boston, Mass.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WINDSHIELDS AND WINDSHIELD CLEANERS.

Conover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

Coes Wrench Co., Worcester, Mass.

Cutter, Geo. A., Taunton, Mass.

Walworth Mfg. Co., Boston, Mass. (Stillson.)

THE ACCESSORY -AND- GARAGE JOURNAL
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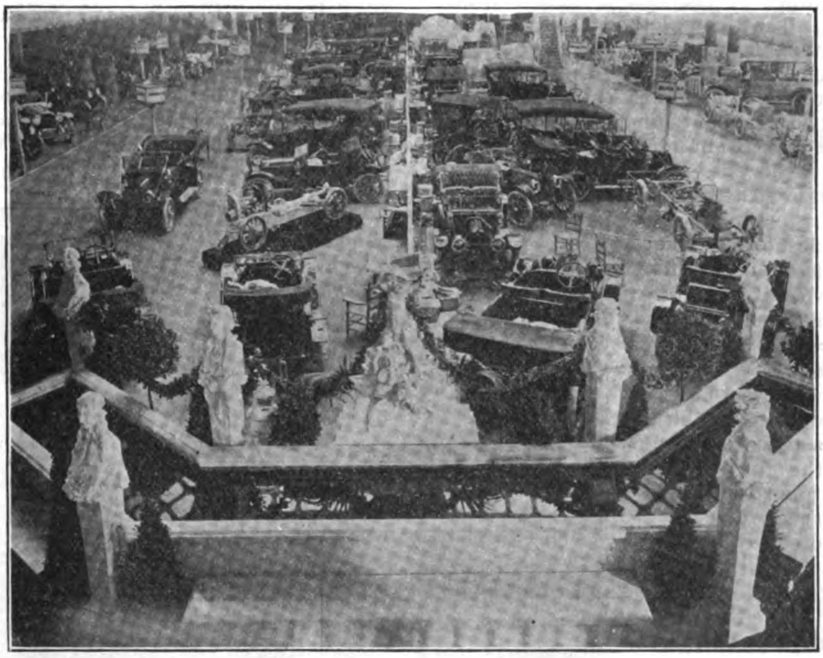
NEW YORK'S SHOWS GREAT SUCCESSES.

Largest Number of Enormous Industry's Products Ever Exhibited Attracts Throng That Overwhelms Metropolis—Decided Progression in Every Phase of Pleasure Car and Service Wagon Design and Construction.

THE New York automobile shows, the last of which will come to an end the evening of Jan. 20, have been from every point of view the most valuable to the trade and industry ever organized in the United States. While this statement does not reject the volume of business transacted it is made with direct reference to the education of the manufacturers, distributors, and agents to the unquestioned merits of the differing lines represented. Nothing can be more promotive of trade than a knowledge of what the people want, and what the people want they must be given. The acquiescence to demands in design and equipment indicates better than any other factor to what extent the market has been studied and the degree to which requirements have been incorporated in the machines.

So far as the shows themselves are concerned they were decidedly attractive as to decorations. Great care had been taken to have the settings appropriate and in keeping with the spirit of the expositions. The attendance has been large and the visitors have come from all sections of the United States. When New York is so overrun that its hotels will not accommodate all who would be guests, and this influx is attributed to the displays of motor cars, it may be judged that there is a degree of interest manifested that is as widespread as it is surprising.



The Auditorium at Madison Square Garden from the Entrance, During the Display of Pleasure Cars.

The first exhibition was that in the ball room of the Hotel Astor, organized as the Importers' Salon, which was opened Jan. 2 and was concluded Jan. 10. This was necessarily a small display for but 62 cars and chassis of 17 different makes were shown by the 15 exhibitors. The show was decidedly interesting, however, and there were several new body and engine designs seen that were as especially attractive to American designers as they were to the visitors.

The Madison Square Garden show, which after all may not be the last to be held in that auditorium, was opened the evening of Jan. 6. This was the first or pleasure car section in which was displayed a total of 415 exhibits, this being the largest number ever seen at any metropolitan exhibition. It was thoroughly representative and it was decidedly complete. Viewed from every aspect the show was better than in any previous year and it was an undertaking of no little proportions to systematically examine each exhibit and give to each the time that was really necessary to make intelligent comparison. The exhibition space available limited the showing of cars, there being but 60 different makes displayed, and there was a disposition to subordinate the chassis to the complete car to a greater extent than in any previous show. This fact was especially noticeable of some of the best known machines. In other words there appeared to be a realization that the buying and interested people could obtain whatever information was desirable from inspection of the finished vehicle equally as well as from

The Exhibition of Service Wagons on the Main Floor of Madison Square Garden, as Seen from the Balcony.

the stripped mechanism, while the former could be shown to satisfy practically all inquirers.

There were in all 189 complete cars shown and of these four were cooled by air. This number included 112 touring cars in the common acceptance of the term, and 40 runabouts, a total of 152, while in addition were shown 12 limousines, 12 berlines, five coupes, three phaetons and two landaulets. Outside of these there were four special exhibits, three being racing cars and one the winner of the last contest for the Glidden trophy. In all 41 complete chassis without body equipment were displayed, this bringing the total of gasoline conveyances up to 234. There was as well a division of electric machines shown that included nine coupes, two runabouts and two broughams.

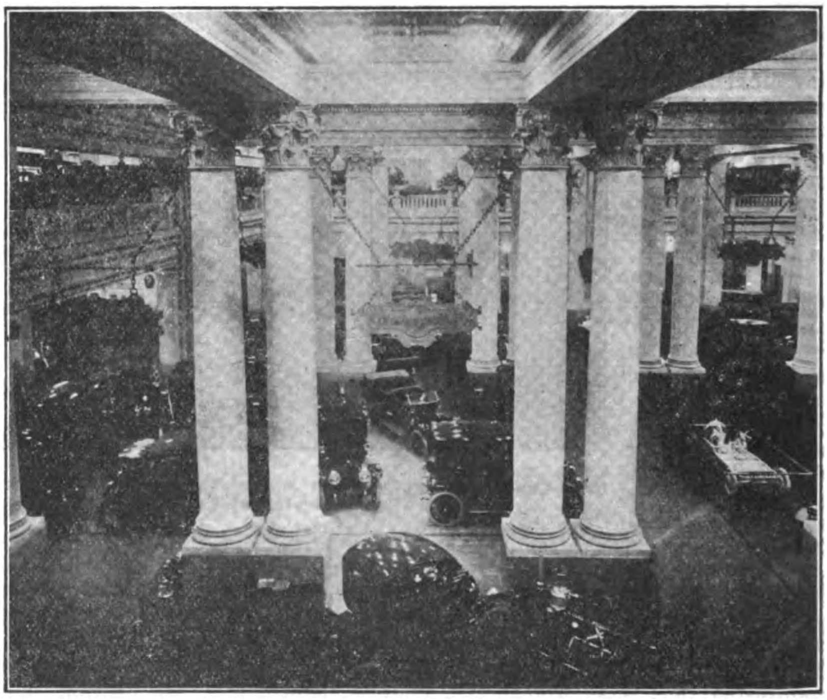
Summarizing the cars by number of engine cylinders there were three of one cylinder, three of two cylinders (including two two-cycle motors), 134 of four cylinders (including four two-cycle and six sleeve valve motors), and 49 of six-cylinders (including one sleeve valve motor). By percentage the one and two-cylinder motors represented 1.58 per cent., the six cylinders 25.93 per cent. and the four cylinders 70.89 per cent. of the total of 189 exhibition cars. Of the chassis the six-cylinder numbered 14 and the four-cylinder 27, the relative proportions being 34.14 and 65.86 respectively.

The section devoted to motorcycles was unusually interesting, there being no less than 16 makes exhibited, which included 45 single-cylinder machines, 18 twins and two with four-cylinder motors, the total being 65. There was no question of the decided interest taken in these vehicles.

The accessory exhibitors totalled 329, these including 10 different publishing firms printing from one to three magazines. The grand total for the first week of the show was 405, but this number was somewhat reduced with the opening of the second week when 31 different makes of power wagons replaced the pleasure cars and these represented approximately 100 different types of chassis. The accessory exhibitors continued with comparatively few changes, but the motorcycles were withdrawn. This was by far the largest and best display of power wagons ever shown in America and the majority of the exhibitors were those who have been engaged in the production of pleasure cars for considerable periods. Of the 31 different makers but seven exclusively produce service vehicles, and eight of the 31 build electric machines. It will be observed there is a decided gain in the number of battery driven wagons, both as to make and number, when this show is contrasted with previous exhibitions.

The interest manifested in the power wagons was surprisingly keen and it may be said that with rare exceptions the visitors were impelled by desires to purchase or to study the conveyances at close range with a view of utilizing them in present or prospective business interests. Those in attendance came from all sections of the country and this was regarded as being an indication of a practically universal demand for motor transportation wherever business exists in sufficient volume. Besides there were many who had special problems to submit to the experts of the different concerns exhibiting, in many instances large investments being prospective.

The exhibition of the National Association of Automobile Manufacturers at the Grand Central Palace, which was inaugurated the evening of Jan. 10, was large in the sense that the total number of vehicles displayed was considerably larger than at Madison Square Garden. It being for both pleasure and service wagons the visitors were interested in both classes of machines and the exhibition took on the nature of the shows of previous years. Grand Central Palace, with its three floors, the main hall being on the second floor, does not give the impression of large area, but



A Glimpse Between the Massive Pillars of the Main Hall, Grand Central Palace, During the N. A. A. M. Exhibition.

it contained 36 different makes of pleasure automobiles and 37 different makes of power wagons, a total of 73. As a rule the cars were of the low and moderate prices but there was every grade of service transport, from the tiny "one lunger" to the truck with 15,000 tons capacity. The exhibition served to make known to the metropolitan experts a considerable number of machines that had never before been displayed, and naturally there was an unusual degree of interest in whatever was shown for the first time, this applying to both the pleasure and service vehicles. The number of accessory exhibitors was small as compared with the total showing at Madison Square Garden, and in several instances displays were made at both exhibitions. The visitors were numerous and it might be stated that many so timed their visits to New York to see the show at Grand Central Palace and the last of the pleasure car and the first of the power wagon shows at Madson Square, a plan that made it possible to get the benefit of all three.

The volume of business transacted at all shows cannot be measured by the number of vehicles or articles disposed of while they are in progress, but if one is to judge the probable results from the actual interest obtaining, and the careful attention directed to the exhibits, it is entirely reasonable to assume that the exhibitions will in every way bring satisfactory returns to the motorists generally and to the organizers specifically.

COFFIN HEADS CONTEST ASSOCIATION.

Howard E. Coffin of the Hudson Motor Car Company was chosen president, A. L. Riker of the Locomobile Company of America vice president, E. R. Hollander of the Fiat Automobile Company secretary-treasurer, and Russell A. Field assistant secretary-treasurer, at the annual meeting of the Manufacturers' Contest Association, Inc. The first three officers and George M. Dickson of the National Motor Vehicle Company, and C. A. Emise of the Lozier Motor Company, constitute the board of directors. Howard Marmon of the Nordyke & Marmon Manufacturing Company was continued as chairman of the rules committee, S. A. Miles, from the National Association of Automobile Manufacturers; H. A. Bonnell from the Automobile Board of Trade, and Jesse Froelich from the Importers' Salon were named as an advisory committee to the contest board of the American Automobile Association. E. R. Hollander, A. L. Riker, C. A. Emise, M. C. Meigs of the Pierce Motor Company and P. D. Wagoner of the General Vehicle Company were made a committee to confer with the American Automobile Association relative to a policy as to racing competitions. The membership of the organization increased from 39 to 93 members during the year.

DUNN SUCCEEDS HIMSELF.

H. T. Dunn of the Fisk Rubber Company was elected to succeed himself as president for the present year, and to succeed himself as director for three years, at the annual meetings of the members and directors of the Motor and Accessory Manufacturers, Inc., which were held recently. In addition to Mr. Dunn, L. M. Wainwright of the Diamond Chain & Manufacturing Company, and E. S. Fretz of the Light Foundry & Manufacturing Company were chosen directors, and F. C. Billings of Billings & Spencer Company, was elected to fill the vacancy in the directorate by the resignation of F. E. Castle. At the meeting of the directors Mr. Dunn was chosen president, with these associates: James H. Foster first vice president; C. E. Whitney, second vice president; Claire L. Barnes, third vice president; L. M. Wainwright, secretary; William M. Sweet, general manager. The John L. G. Dykes Company, Chicago, Ill.; Cotta Transmission Company, Rockford, Ill.; American Bronze Company, Berwyn, Penn., and the Detroit Lubricator Company, Detroit, Mich., were elected to membership. Executive, show and allotment, finance, traffic and membership committees were appointed. The show and allotment committee consists of D. J. Post, chairman; H. E. Raymond, C. T. Byrne, James H. Foster and F. C. Billings.

U. S. TIRE COMPANY FILES APPEAL.

The patent claims of the Republic Rubber Company, Youngstown, O., having been sustained in its suit alleging infringement of its rights by Morgan & Wright, Detroit, Mich., one of the subsidiary companies of the United States Tire Company, recently tried before Judge Hazel in the United States Circuit Court for the Southern District of New York, appeal has been taken by the defendant corporation for review by the United States Circuit Court of Appeals. Pending the determination of the appeal the United States Tire Company and the Republic Rubber Company have reached an agreement whereby the manufacture and sale of the tires on which the suit was based will be continued without interruption.

COL. CLIFTON AGAIN PRESIDENT.

Col. Charles Clifton, president of the Pierce-Arrow Motor Car Company, for a number of years executive of the Association of Licensed Automobile Manufacturers, was chosen for the second time head of the Automobile Board of Trade at the annual meeting of that body. The other officers chosen are Charles C. Hanch, vice president; Col. George Pope, treasurer; Benjamin Briscoe, secretary, and these officers with S. T. Davis, Jr., Hugh Chalmers, S. D. Waldon and W. C. Leland, directors. H. A. Bonnell was re-elected general manager. The admission of the International Motor Company made the membership 51. Patents, trade, statistical, show, legislation and law, intercourse and arbitration, good roads, publicity and mechanical co-operation committees were named. The show committee for 1913 consists of Col. George Pope, Alfred Reeves and Merle L. Downs.

PACKARD PROFIT 14 PER CENT.

According to the annual statement of the Packard Motor Car Company, Detroit, Mich., the net profit for 1911 was 14 per cent. on capital of $10,000,000. The resources of the company are stated as $16,110,756.28, of which $8,265,845.82 is the plant. The surplus charged in the liabilities is $2,984,021.81. The plant has 37.7 acres of floor space and the maximum number of employees for 1911 was 7575 in August with a monthly payroll of $524,407.

TIRE PRESSURE GAUGE LITIGATION.

A. Schraeder's Sons, Inc., making answer to the suit of the Twitchell-Garvey Manufacturing Company of Los Angeles, Cal., at New York, which alleges infringement of patent, denied the allegation and set up a patent owned by the defendant dated March 1, 1898, which is claimed to be so different as to remove the defendant entirely outside the claims of the plaintiff, aside from the matter of date.

VAN DYKE PLANT BOUGHT BY FEDERAL.

The plant of the bankrupt Van Dyke Motor Car Company, Detroit, Mich., with its machine equipment has been bought by the Federal Motor Company, which is now ready to operate it for the production of cars. The plant has a capacity of 1000 cars a year with ample space for extensions to double this output.

WHO'S WHO IN THE INDUSTRY.

DR. C. G. PERCIVAL, "PUBLICEST."

Few promoters of the use of the motor car are as well known as Dr. Charles G. Percival of New York, N. Y., formerly of Boston, who describes his profession as "publicest," and who has been engaged in advertising and publicity promotion for years. He is now driving the Abbott-Detroit "Bull Dog" the 100,000-mile tour in the United States, Mexico and Canada, undertaking travel over roads that were never before driven over by a motor vehicle. He has visited 44 of the states in the Union and recently returned from Alaska where he ventured over trails that were hardly passable for animals. Just where his tour will eventually lead is somewhat dependent upon circumstances, for it would appear he has exhausted all the extremes and must now settle down to ordinary driving.

Dr. Charles G. Percival, Now Driving the Abbott-Detroit "Bull Dog" on the 100,000-Mile Tour.

Dr. Percival was well known in bicycle days as a writer and manager, and was official handicapper for the League of American Wheelmen. Later he became identified with motoring as advertising manager and in this capacity has been connected with some of the best known concerns in the industry. He has originated and directed some exceedingly interesting "stunts" and naturally has become widely and favorably recognized the country over as the only and original "Doc." Percival.

SAMUEL A. MILES.

When the Chicago automobile show will be opened the evening of Jan. 27 it will be the largest and most comprehensive display ever organized by that past master of western motor vehicle displays, Samuel A. Miles, who has directed all of the exhibitions held in Chicago for more than a decade. Mr. Miles always leads a double life as manager, from the fact that he devotes himself the year round to the promotion of the Chicago exposition, which is organized under the auspices of the National Association of Automobile Manufacturers, and he is also general manager of that body. This season when the association decided to conduct a combined display of pleasure and service wagons at Grand Central Palace in New York City, Mr. Miles was selected to assume the management of this third exhibition also, this responsibility making him the most multifarious manager known to the industry and the trade. Mr. Miles, however, permitted his duties to rest but lightly upon him and he might have taken on another show or two had he been properly approached.

Samuel A. Miles, Manager of the Chicago Motor Vehicle Shows.

Mr. Miles knows the Chicago people and they likewise know him. Incidentally he has been the cause of more westerners buying automobiles than is realized. He doesn't know how many himself, but he says he believes that it will aggregate a good many thousands. Mr. Miles says of the Chicago pleasure and vehicle displays that they will be in every way more satisfactory than in previous years, and that they should be decidedly more attractive and productive.

CHESTER I. CAMPBELL.

The one man toward whom all of the motorists of New England turn with expectancy is Chester I. Campbell, general manager of the two power vehicle exhibitions to be held in Boston at Mechanics' building under the auspices of the Boston Automobile Dealers' Association, and the Boston Commercial Motor Vehicle Association, of which organizations he is secretary. Mr. Campbell has had a hand in the conduct of every exhibition of automobiles organized by the agents of Boston, and for a number of years he has devoted practically all his time to the preparations for and the direction of these displays. Naturally he knows his field, the possibilities, and his resources better than any other man living. In every respect the Boston shows have been successful and it is not too great praise to state that this has been largely due to Mr. Campbell's foresight and energy.

Chester I. Campbell, Manager of the Boston Motor Vehicle Shows.

As a matter of fact, it has been Mr. Campbell's policy to begin work for the year to come long before the show he had in hand has been held, and it is not uncommon for him to have applications for space a year or two ahead. This year Mr. Campbell sauntered over to Europe to take a respite from his strenuous task and incidentally make a few notes for guidance in his choice of decorations. Mr. Campbell is probably as well known as any executive of automobile shows in America and he has undoubtedly been so successful that he will continue to serve in his present capacity until he retires from active participation in business.

MAY BUILD LAUTH TRUCKS AT GIBSONBURG.

The Lauth-Juergens Motor Truck Company, Fremont, O., will build a branch factory for the manufacture of trucks at Gibsonburg, O., the coming spring conditionally upon the citizens of that town subscribing $50,000 to the capital of the company.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

THE basic principles underlying magneto operation and methods of producing current in the conventional revolving armature type have been considered at length in previous discussions, but there has been such an appreciable improvement and refinement that further exposition is needed to bring the subject up-to-date. The magneto is now the most popular method of ignition, it is used on the smallest and cheapest runabout as well as the most expensive touring car. Therefore, a review of the methods of construction, the principles of operation and the application of the leading types is timely and should be of value to those who have to do with internal combustion engines of any form.

Two High-Tension Systems Used.

There are two high-tension systems in common use, these being known as the "transformer coil" and the "true high-tension" methods, respectively. Each form possesses advantages and while there is some difference of opinion among designers and engineers as both methods are generally utilized, it must be said that both are good.

In the transformer system, the current generated by the magneto is one of low voltage, there being but one simple winding on the armature. To overcome the resistance of the air gap between the points of the plug in the cylinder, the tension of voltage must be increased. This is done by a separate coil, composed of two windings, and as the current potential is increased this appliance is called a "step up" transformer.

In the true high-tension instrument, the current is raised in value by the windings on the armature itself. Instead of a simple coil, two are employed. One of these is composed of a few turns of comparatively coarse wire, the other of many turns of fine wire. The former is the primary, the latter the secondary winding. Thus the entire apparatus is self contained, and the wiring is much simplified since there is no separate coil. With a transformer coil system, however, the addition of a set of batteries enables one to have a dual ignition system without other apparatus, which is considered to be an important advantage by many.

Two types of magneto generators are used in various ignition systems. The most common form employs the shuttle armature carrying the winding, the whole revolving in the magnetic flux present between the fields of the permanent magnets, the current being produced by the wires cutting the lines of force. The other method employs a stationary winding instead of a rotary one, and inductor pieces are mounted on the revolving shaft to change the path of the magnetic flux so it energizes the wire at certain portions of the revolution and thus generates the electrical impulse, producing a useful spark.

Both of these types may be divided into either of the classes previously mentioned. The principles involved in revolving winding types have been emphasized, but those on which inductor magnetos are based are not as generally known so it will be desirable to consider them before describing the instruments in which they are utilized.

Action of Inductor Magneto.

In order to utilize the energy produced in a revolving winding, some form of sliding contacts or brushes is necessary to lead it to the external circuit. These are attached to some stationary part of the magneto and bear against slip rings or other revolving contacts connected to the winding. Vibration or dirt may cause the brushes to be separated slightly from the parts against which they bear. While a high-tension current will pass through without difficulty, when these carry a current of lower potential, it may not have sufficient strength to overcome the resistance interposed and irregular ignition may result. The advantage of having a stationary winding is thus emphasized by those favoring the inductor type of magneto.

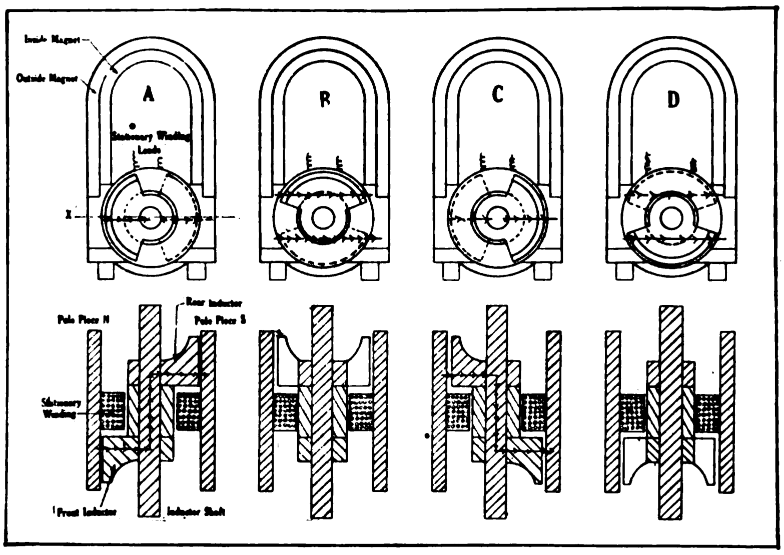


Fig. 1—Principles of Inductor Magneto.

We have seen that in a revolving wound armature the current was produced by the coils of wire cutting the lines of magnetic energy, and that the electromotive force or tension of the current was dependent upon the rate of cutting. A winding of several turns may be considered as several windings of one turn connected in series, so a higher voltage is obtained when a number of convolutions are used, just as when a number of cells are connected in series to obtain a higher potential than that obtained from a single element.

Elementary Parts of Inductor Magneto.

Certain elementary parts of an inductor magneto are shown at Fig. 1, and the position of the drive shaft and inductors at different portions of a revolution is also shown. The upper view shows the magneto as it would appear with the end plates removed, the lower illustrations depict sections along the line X-Y of the corresponding drawing above them. Two magnets are shown, but there are more in a practical instrument because a series will supply more magnetic flux or energy than a single pair. These are securely fastened with all the north poles against the pole piece N and all the south poles against the pole piece S. These are iron, but the base is brass. If an iron or steel base were used, part of the magnetism would escape through it instead of taking the proper course.

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics *published* by The Automobile Journal Publishing Company. *It will* be continued through several numbers.

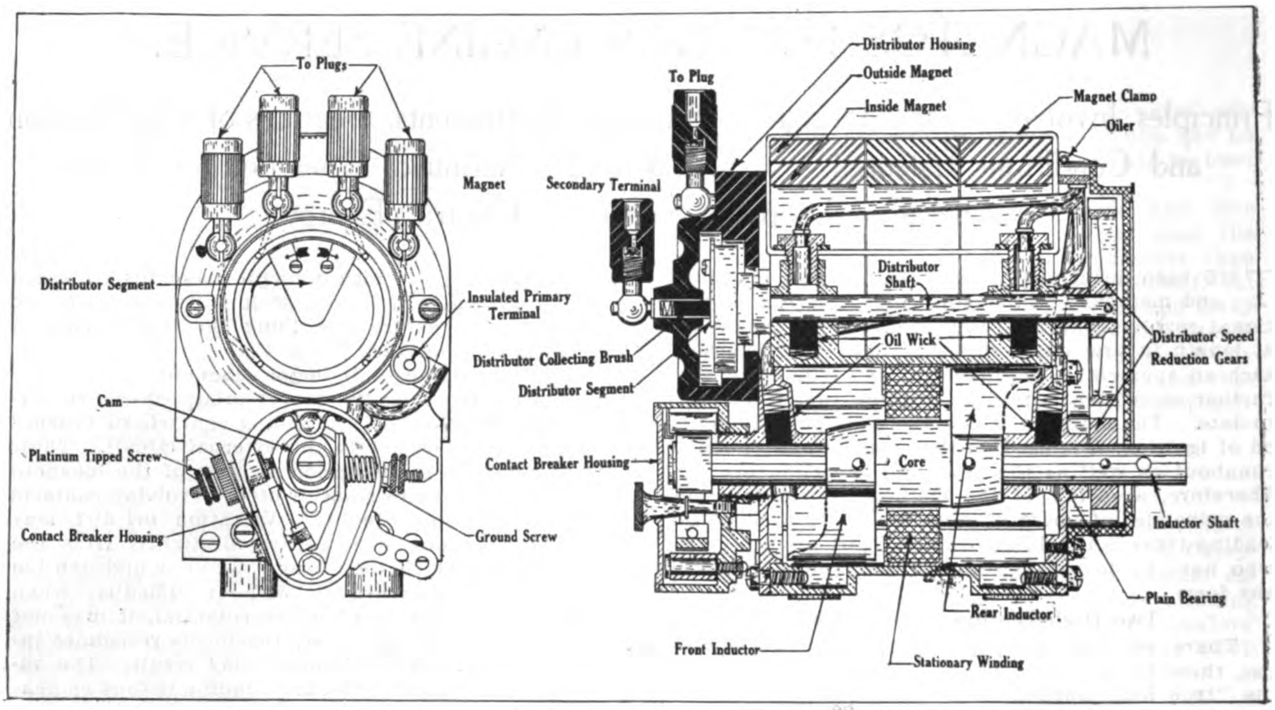

To Plugs
Magnet
Secondary Terminal
Distributor Segment
Insulated Primary Terminal
Distributor Collecting Brush
Distributor Segment
Cam
Platinum Tipped Screw
Contact Breaker Housing
Contact Breaker Housing
Ground Screw
To Plug
Distributor Housing
Outside Magnet
Inside Magnet
Magnet Clamp
Oiler
Distributor Shaft
Oil Wick
Distributor Speed Reduction Gears
Core
Inductor Shaft
Plain Bearing
Rear Inductor
Front Inductor
Stationary Winding

Fig. 2—Sectional View of Remy Magneto, Showing Stationary Coil and Revolving Inductor.

The stationary coil is securely retained by the pressure of the pole pieces against it and by a clip. Two inductors are mounted on the shaft and rotate with it. In order to form a path for the magnetic force, the inductors, core and shaft are composed of magnetic material. The direction of magnetic flow through the revolving parts is indicated by the arrows, the full ones showing the path through visible parts, the broken ones mark out the course taken through a normally invisible component.

In position A, the front inductor is adjacent to the pole piece N and the rear inductor is close to S. An iron path is formed between the inductors by the shaft and core. The cross section of the shaft is not large enough to carry all the magnetism so the core assists by carrying part of the flux. The magnetism thus passes from the pole piece N to the front inductor, through the core and shaft to the rear one and thence to the pole piece S. The magnetism passes through the coil in this instance from the front to the back.

In position B, the inductors are so placed that each one forms a path between the pole pieces N and S, and the magnetic force does not pass through the coil because of the shorter direct path provided by the inductor assembly. In position C, the conditions are similar to those shown at A except that the flow of magnetism is reversed, passing through the coil from back to front. When the parts are as shown at D, the same effect is obtained as in position B except that the front inductor is down, and the back one up. In this position, no magnetism passes through the coil.

It will be seen that as the inductors revolve the amount of magnetism passing through the coil is continually varying, thereby inducing in the winding an electromotive force, which is reversed twice during each revolution when the inductors pass the positions A and C. As long as the direction of the magnetic flow remains the same, increasing and decreasing flow induces electromotive forces in the winding having opposite directions. Increasing magnetism in one direction and decreasing flow in the opposite path induces a current having the same course.

Features of Remy Magneto.

A magneto, as constructed, contains in addition to the simple elements shown at Fig. 1, the parts shown at Fig. 2, which depicts the typical form based on the inductor principle. It will be seen that there is a circuit breaker, often called a contact maker or timer, and in addition, when the device is to be used for more than one cylinder, a distributor. The former consists of a cam, a cam lever and contact points. The cam is secured to and driven by the inductor shaft, and at certain parts of the revolution, it causes the contacts, which normally touch, to separate twice per turn of the shaft. The distributor is used to collect the high-tension current obtained from the transformer coil and supply it to the spark plugs at the proper time to insure firing the combustible gas in the cylinders of the motor.

The distributor is of hard rubber, attached to the frame of the magneto. There is a round opening in the middle, and the various wires leading to the spark plugs project into this. A revolving disk of hard rubber is employed to carry the distributor segment. This revolves, passing close to the wires leading to the spark plugs but it does not touch them. The hard rubber disc carrying the segment is secured to the distributor shaft, which is geared to the inductor drive shaft. The magneto furnishes current for a spark every half revolution of the inductors and the gearing between the main and distributor shafts is such that for every revolution of the former, the distributor segment advances from the position for firing one cylinder to that causing the high-tension current to flow to the next one. In a four-cylinder magneto, the distributor shaft makes one revolution for every two

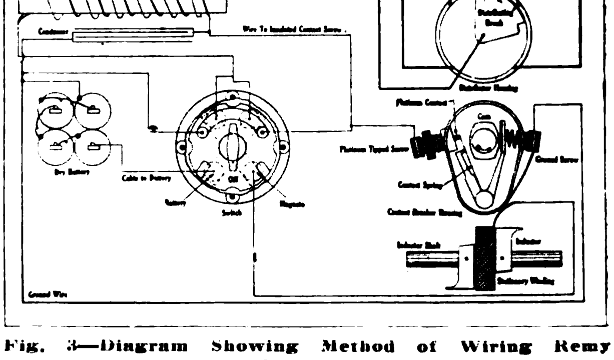

Spark Plug
High Tension Wire to Plug
Secondary Winding
Primary Winding
High Tension Wire To Distributor
Condenser
Wire To Insulated Contact Screw.
Distributing Brush
Distributor Housing
Platinum Contact
Cam
Platinum Tipped Screw
Ground Screw
Contact Spring
Contact Breaker Housing
Inductor Shaft
Inductor
Stationary Winding
Dry Battery
Cable to Battery
Battery
Off
Switch
Magneto
Ground Wire

Fig. 3—Diagram Showing Method of Wiring Remy Magneto.

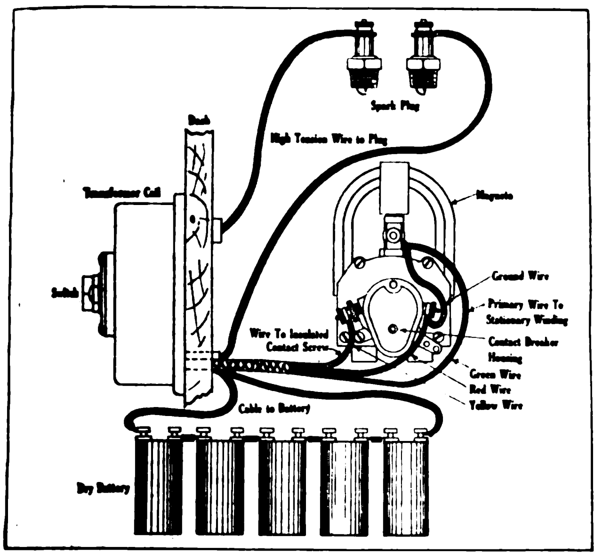

Spark Plug
Dash
High Tension Wire to Plug
Transformer Coil
Magneto
Switch
Ground Wire
Primary Wire To Stationary Winding
Wire To Insulated Contact Screw
Contact Breaker Housing
Green Wire
Red Wire
Yellow Wire
Cable to Battery
Dry Battery

Fig. 4—Remy Dual System for Two-Cylinder Engine.

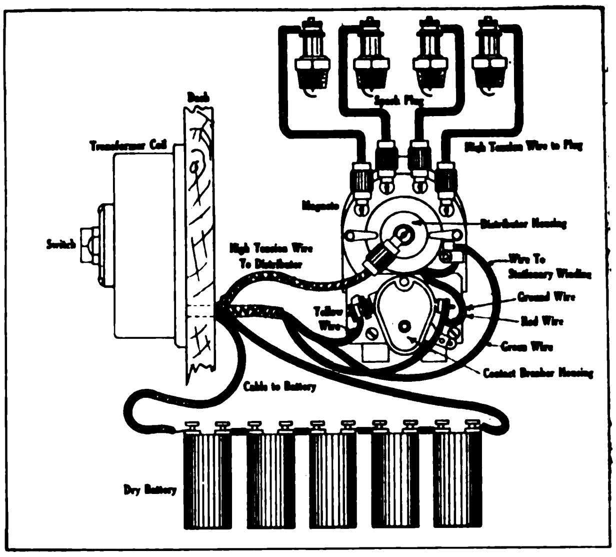

Dash
Spark Plug
Transformer Coil
High Tension Wire to Plug
Magneto
Distributor Housing
Switch
High Tension Wire To Distributor
Wire To Stationary Winding
Ground Wire
Yellow Wire
Red Wire
Green Wire
Contact Breaker Housing
Cable to Battery
Dry Battery

Fig. 5—Four-Cylinder Ignition by Remy Dual System.

of the inductor shaft, which is driven at crankshaft speed.

Wiring Inductor Magneto.

While an inductor magneto can be utilized in the same manner as that from any alternating current producer, the usual method of wiring is shown at Fig. 3. The induction coil used in connection consists of an iron core surrounded by two windings, one, a primary consisting of a few hundred turns of coarse wire being wound directly upon it. The other, which is wound over the primary is called the secondary and contains several thousand convolutions of fine conductor.

In use, the low-tension current, either from the magneto winding or battery, is allowed to flow through the coarse wire, and when interrupted, a current of high potential is induced in the secondary winding because of the great suddenness with which the magnetism leaves the core. The interruption of the primary circuit is produced by the contact points of the timer being separated under the influence of the cam.

As these points separate the current still tends to flow and a brilliant spark or arc is formed between them. This is objectionable, and its heat would eventually burn the points away if the effect was not minimized by the condenser forming part of the coil, which absorbs the surplus current. The condenser consists of layers of tinfoil separated by insulation, the alternate sheets being connected to the same terminal. This component is shunted between the contact points as shown in diagram.

The parts shown have been described and their functions discussed. Their relations to each other must be considered to show how the low-tension current is changed to an impulse of higher potential. The coil box carries a switch on its face, the various connections leading to it being clearly shown in the diagram Fig. 3. There are three positions, battery, magneto and neutral or off. If the switch be turned to the magneto position, the current produced in the stationary winding flows through the primary winding of the induction coil, and this is stopped the instant the contacts separate. This stoppage induces a high voltage current in the secondary winding, which is led to the proper spark plug through the distributor. If the switch be on the battery position, the same thing occurs except that the energy is derived from the chemical producer, not from a mechanical generator.

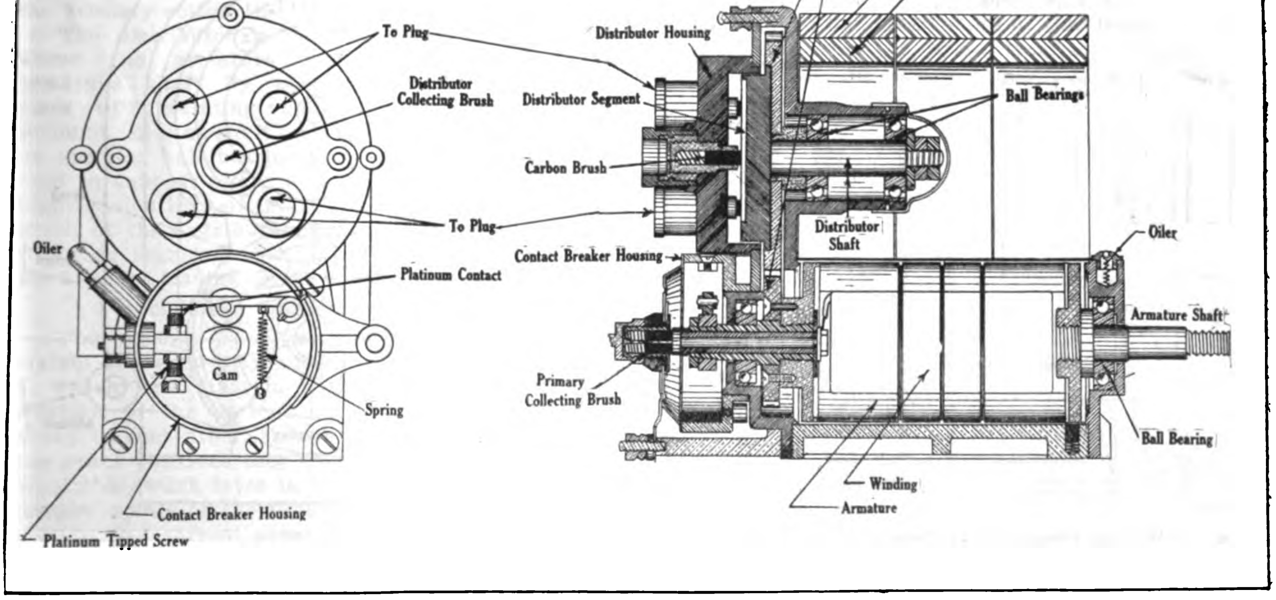

To Plug
Distributor Collecting Brush
To Plug
Oiler
Platinum Contact
Cam
Spring
Contact Breaker Housing
Platinum Tipped Screw
Distributor Speed Reduction Gears
Outside Magnet
Inside Magnet
Distributor Housing
Distributor Segment
Ball Bearings
Carbon Brush
Distributor Shaft
Oiler
Contact Breaker Housing
Armature Shaft
Primary Collecting Brush
Ball Bearing
Winding
Armature

Fig. 6—Sectional View of Splitdorf Model B Magneto Clearly Depicts Arrangement of Parts.

Batteries Make Starting Easier.

Although the magneto may be used for starting, the batteries are supplied for emergency use and for making starting easier when the engine is cold or when conditions are not favorable to quick turning of the hand crank. Many four-cylinder cars can be started, if there be gas in the cylinders, without the handle if a spark can be made to occur in the cylinder about to fire. To obtain this spark independently of the timer, which is only operated as the inductor shaft turns, a push button is provided on the switch. Pushing this button when the switch is on the battery position causes the current to flow through the primary winding; when the button is released, it interrupts the passage of electricity in the same manner as though the points of the timer were separated by the cam.

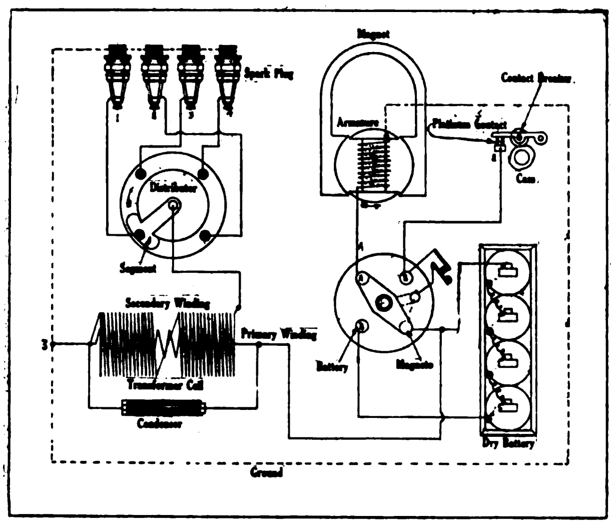

Magnet
Spark Plug
Contact Breaker
Armature
Platinum Contact
Cam
1
2
3
4
Distributor
Segment
Secondary Winding
Primary Winding
3
Transformer Coil
Condenser
Battery
Magneto
Dry Battery
Ground

Fig. 7—Diagram Illustrating Principles of Splitdorf Magneto System.

Remy Wiring Diagrams.

A diagram showing the Remy dual system for two-cylinder motors is given at Fig. 4 with all parts clearly shown, while that at Fig. 5 depicts its application to four-cylinder power plants. It will be noted that in the two-cylinder motor the distributor is omitted, the spark plugs being connected in series. This is done by connecting a terminal of the high-tension winding to each plug instead of grounding one of the secondary leads as when a distributor is employed. The metal of the engine forms the connection between the two plugs. Sparks occur in both cylinders at the same time, but as one of them is filled with burnt gas when the other is being ignited, the spark is utilized only in the cylinder full of fresh, compressed gas. Although the two sparks occur only once during each revolution of the crankshaft it is customary to run the inductor of the magneto at crankshaft speed and use a form of cam that breaks the circuit once instead of twice each revolution. The higher rotative speed means a higher electromotive force in the stationary coil because of the greater number of times the lines of magnetic flux are reversed through the coil. The connections and method of operation of the four-cylinder system are obvious.

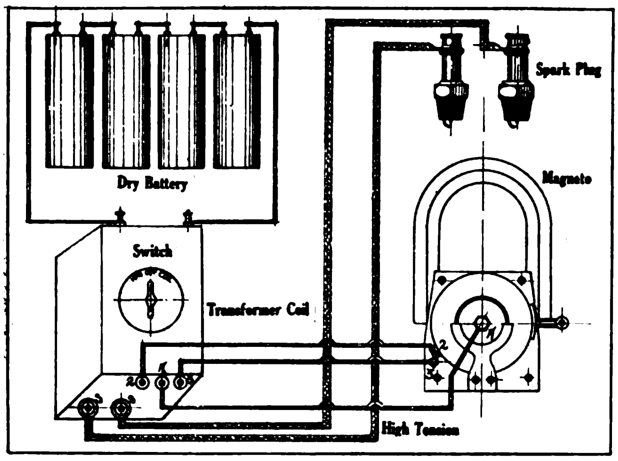

Spark Plug
Magneto
Dry Battery
Switch
Transformer Coil
2
3
High Tension

Fig. 8—Wiring Diagram for Two-Cylinder Engine.

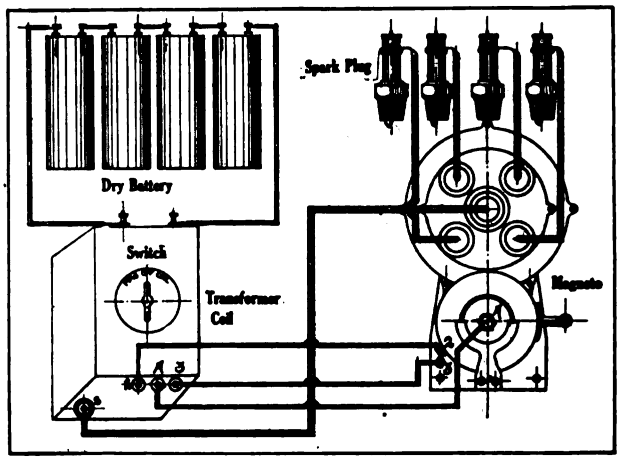

Spark Plug
Dry Battery
Switch
Transformer Coil
Magneto
2
3

Fig. 9—Splitdorf Ignition System for Four-Cylinder Motor.

How Spark Time Is Varied.

The spark is advanced and retarded by rocking the circuit breaker housing about the axis of the inductor shaft by means of a rod and lever connection with the spark control lever on the steering wheel. By shifting the timer case in this manner, the time of sparking relative to the crankshaft and inductor position can be varied. If the casing be moved in the direction of rotation the cam will have to move further before it interrupts the current and the spark time is retarded. On the other hand, if the contact breaker housing be advanced in a direction opposite to that of the inductor shaft movement, the cam opens the circuit sooner and the ignition of the charge is started earlier.

Operation of Splitdorf Magneto.

The model B Splitdorf magneto is a very popular type that embodies the separate transformer coil prin-

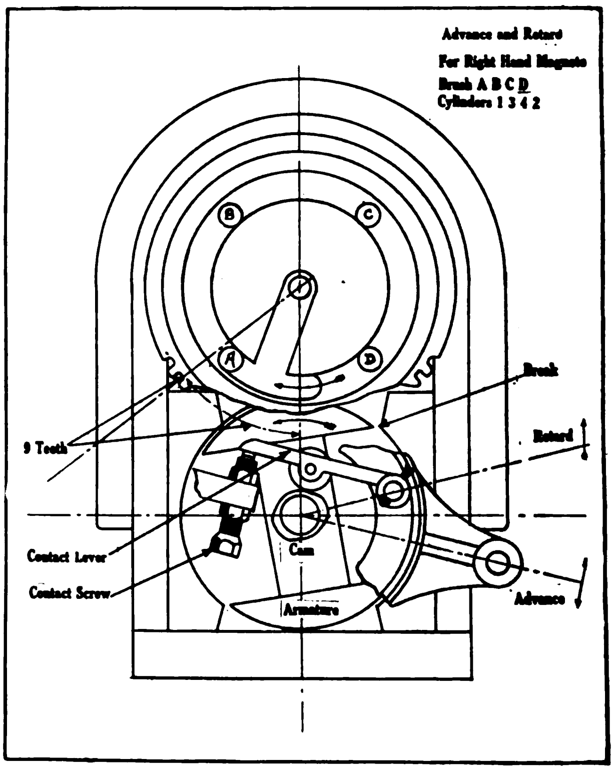

Advance and Retard
For Right Hand Magneto
Brush A B C D
Cylinders 1 3 4 2
B
C
A
D
Break
9 Teeth
Retard
Contact Lever
Cam
Contact Screw
Armature
Advance

Fig. 10—Illustrating Advance and Retard of Splitdorf Magneto.

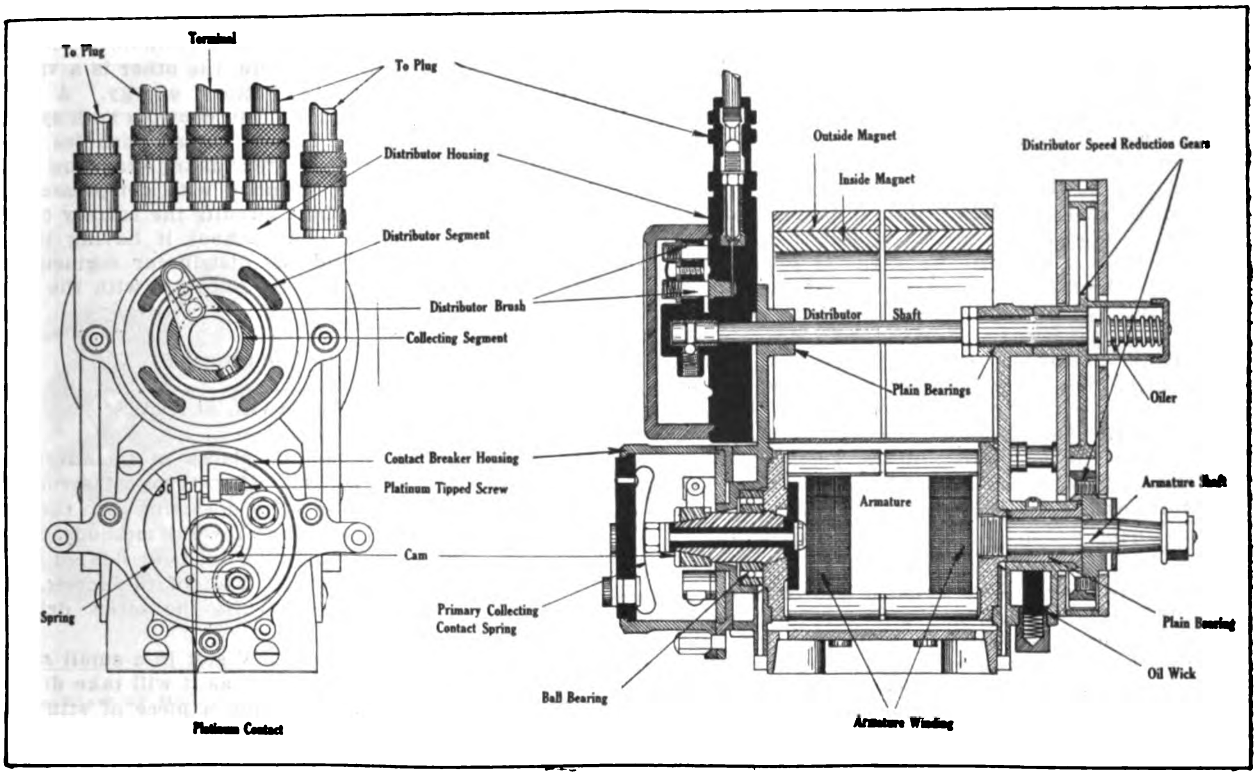

To Plug
Terminal
To Plug
Distributor Housing
Distributor Segment
Distributor Brush
Collecting Segment
Contact Breaker Housing
Platinum Tipped Screw
Cam
Primary Collecting Contact Spring
Spring
Platinum Contact
Ball Bearing
Outside Magnet
Inside Magnet
Distributor Speed Reduction Gears
Distributor Shaft
Plain Bearings
Oiler
Armature
Armature Shaft
Plain Bearing
Oil Wick
Armature Winding

Fig. 11—End View and Longitudinal Section of Eisemann Magneto Outlines Arrangement of Components.

ciple. The construction of the various parts and their relation to each other is very well defined in the sectional view at Fig. 6. The armature, which has a single winding of comparatively coarse wire is supported on annular ball bearings, and revolves in the magnetic field produced by the permanent horseshoe magnets. One end of the armature winding is grounded, the other is coupled to a conducting plug that passes through the contact breaker end of the armature shaft, but which is insulated from it. Wire gauze brushes are mounted in the contact maker cover and bear against the conducting plug to take the primary current generated in the armature winding to the transformer coil.

The principal parts of the timer are shown at Figs. 8 and 10. This consists of a cam, mounted on and driven by the armature shaft which is used to raise the contact lever and interrupt the circuit between the platinum points at those intervals when the armature is in the position of maximum current production and it is desired to induce a high-tension current in the primary coil of the transformer.

The distributor is mounted inside the magnets, above the armature and is driven from the armature shaft by gearing. This consists of a plate of insulating material carrying a contact segment, and the shaft on which it is mounted revolves on annular ball bearings of the same type as those used to support the armature. The current from the high-tension lead of the coil is supplied to the central brush of the distributor, which bears against the distributing segment, this in turn making contact with the brushes leading to the spark plugs.

Principles of Splitdorf Ignition System.

The general principles involved in the Splitdorf system can be clearly understood by reference to Fig. 7, which is a diagram showing the wiring and the relation of the various components of the ignition group to each other, though these are not depicted in the exact positions they occupy in actual application. With the switch lever in the position shown, and the contact points of the timer making an electrical connection any current generated in the armature winding is short circuited and flows through a limited circuit formed by the wire A, the switch bar, then from the centre of this to the contact 2, thence to the contact points, the ground and back to the armature winding.

When the contact points are separated by the lift of the cam point, the current must then flow from the armature, through the conductor A, through the switch bar to the contact at the other end, which leads to the primary coil, and after passing through this and energizing the core, it returns by way of the ground to the armature winding. As soon as a connection is re-established between the contact points, the current from the armature is again short circuited and cannot pass through the transformer primary coil. The high-tension current path is easily followed.

If the position of the switch blade be reversed, so it is in contact with terminals 2 and B, the battery current instead of the magneto energy is interrupted by the contact points. The current path is then defined by the conductor leading from the battery to terminal B, through the switch bar to the terminal 2, thence to the contact points as long as they are together and through the ground to the primary coil from which it returns to the battery over the conductor leading from the extremity of the primary coil to the batteries. As soon as the points separate, the im-

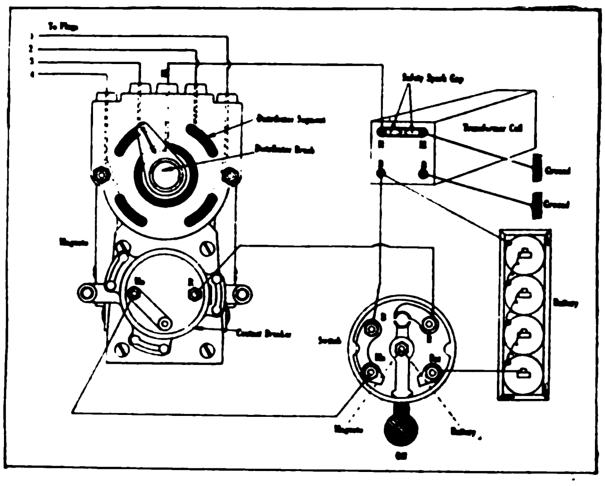

To Plugs
1
2
3
4
Safety Spark Gap
Distributor Segment
Distributor Brush
Transformer Coil
Ground
Ground
Magneto
Battery
Contact Breaker
Switch
Mag
B
Bat
Magneto
Battery
Off

Fig. 12—Eisemann Double System.

pulse of higher potential is induced in the secondary coil because of the sudden demagnetization of the primary coil core. At this moment, the metal distributing segment is in contact with one of the brushes connected with the spark plugs and the spark occurs in the cylinder desired. When the switch lever is in a neutral position, all circuits are open and current cannot flow to the transformer winding.

The method of wiring followed with a two-cylinder engine is shown at Fig. 8, that at Fig. 9 shows the arrangement of conductors when the system is fitted to a four-cylinder motor. The position of the distributor brush, the armature, the cam and the contact points when the timer case is rocked to obtain maximum advance is clearly shown at Fig. 10. At this moment, the cam is about to raise the lever carrying the contact point from the platinum tipped screw, and thus interrupt the short circuit existing in the armature winding so the electricity in the armature can flow through and energize the primary winding of the transformer coil as previously outlined.

The Eisemann Transformer System.

The principal element of the Eisemann dual system is the current producer, which is shown in section at Fig. 11. In this, the magnetic field is produced by either two or three pairs of permanent magnets, depending upon the type of magneto. The E U shown has but two pairs, the type A has three sets. The armature is of soft iron, of the conventional H section and carries the usual single winding of copper wire. One of the ends is connected to the body of the armature, thus being grounded, the other is coupled to the insulated copper bolt coming out of the armature shaft on the contact breaker end. A carbon brush pressing on the head of this bolt collects the current produced in the armature. The contact breaker is similar in construction and operation to those previously described. The distributor is driven by spur gearing, and the shaft to which the distributing contact is attached is mounted on plain bearings. The armature shaft revolves on annular ball bearings. The revolving member or distributing brush makes contact with a series of metal segments imbedded in the insulating block that forms the base of the distributing arrangement.

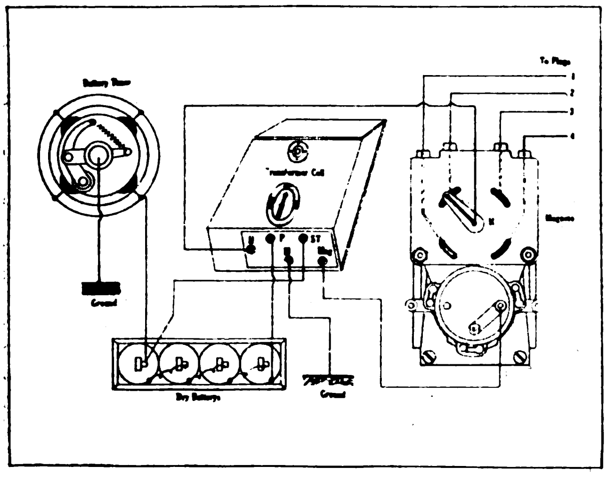


Fig. 13—Eisemann-Carpentier Dual System.

The regular Eisemann system with battery auxiliary is shown at Fig. 12 with all connections clearly defined. The principles involved are practically the same as in the system previously considered, a transformer coil that is suitable for battery current as well as magneto energy being used.

The Eisemann-Carpentier dual system, outlined at Fig. 13, is especially devised for those desiring to have a battery system that is independent of the magneto timer or coil. In this, the battery current is commuted by a separate timer, while a double unit coil is supplied. The high-tension distributor of the magneto is utilized to deliver the secondary current of both coils. One unit of the coil is a plain form designed for use only with the magneto, the other is a vibrator element designed to use battery energy. A single switch, which is part of the coil, controls both systems. A push button on the face of the coil enables one to start the motor without preliminary cranking if the cylinders are properly supplied with compressed gas. Pushing this button, short circuits the battery current through the vibrator coil without it having to pass through the timer, and the distributor segment supplies the cylinder that is about to fire with the necessary spark.

(To Be Continued.)

STARTING SMALL SCREWS.

There are a number of places in the automobile where small machine and other types of screws are utilized. Holding these while inserting into the work is often difficult. There are several methods, among which is the use of a small wire, bent double at one end, and slipped under the head of the screw. This serves to hold it steady, while the screw driver is manipulated.

A second way is to cut a V slot in a small strip of tin. This is, perhaps, the best as it will take different sizes. A third plan is to take a piece of stiff paper and push the screw through it.

Where the above devices cannot be employed a piece of wood, trimmed to fit tightly in the slot in the head of the screw, is driven in hard. This will enable the operator to catch the thread after which the ordinary screw driver is used. Iron or steel screws of small dimensions can be held by rubbing the head of the tool over one pole of a horseshoe magnet.

EMERGENCY VALVE KEY.

While in the majority of motor cars the engine is fitted with mechanically operated valves some utilize an automatic intake. These sometimes occasion trouble by the cotter or valve holding member breaking. Usually these drop into the cylinder and cannot be recovered easily while on the road. An emergency repair in such an event is to take a nut that will slide over the valve stem and file a slot in such manner that it is deeper in the centre than at the edges. This can be accomplished with a thin, flat tool. A cotter pin is then cut in half and inserted through the hole in the stem. The recess will prevent the nut from turning as well as eliminate the tendency of the pin to shear off.

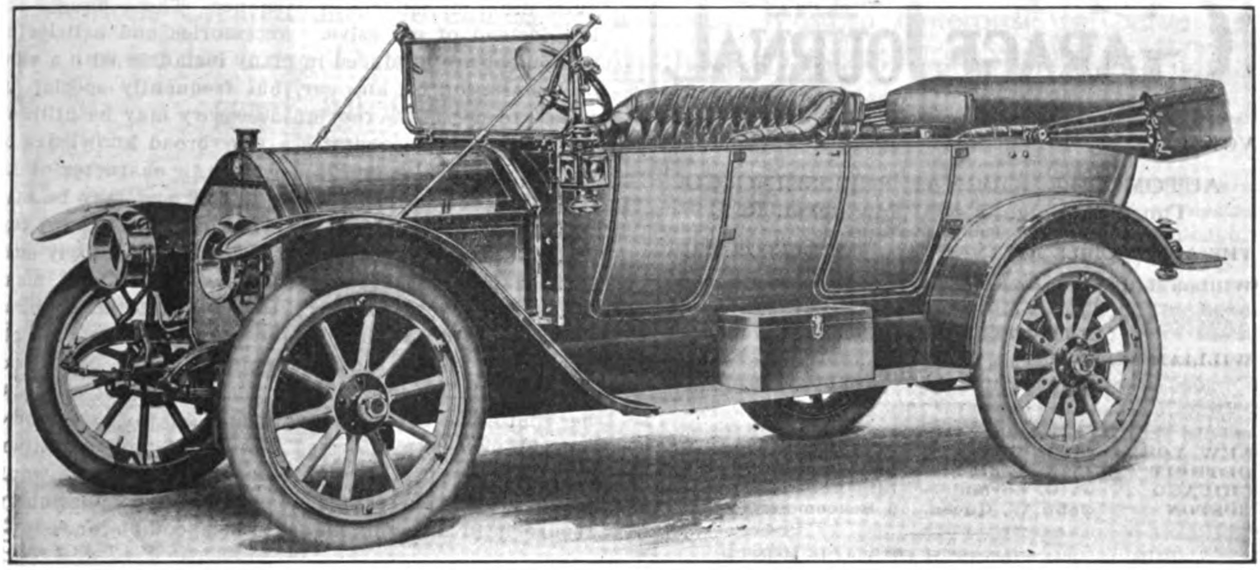
TIGHTENING LOOSE BALL RACES.

Ball races should have a tight fit, but sometimes these work loose. This can be remedied by knurling the surface of the shaft or container where the former is hardened. An alternate method is suggested by a repairman and consists of tinning the shaft after knurling, as the former process fills the small indentations and also serves to keep the oil from working into the channels. Warming the two parts, it is claimed, will unite them much better and a joint thus made will not shift.

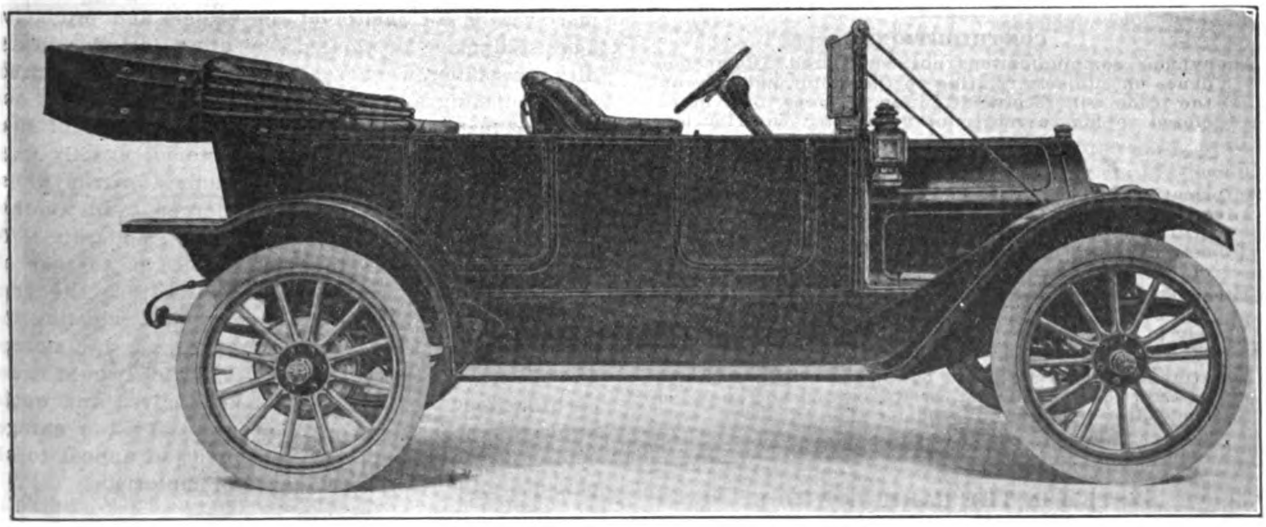
FOOTBOARD COVERINGS.

An owner whose car was fitted with rubber matting desired to replace the worn material and found that the pyramid form was rather costly. Having some first class linoleum of a neat pattern, he proceeded to cut and fit it to the footboards of the machine. It gave excellent service as it was cleaned easily and was not affected by oil or dirt.

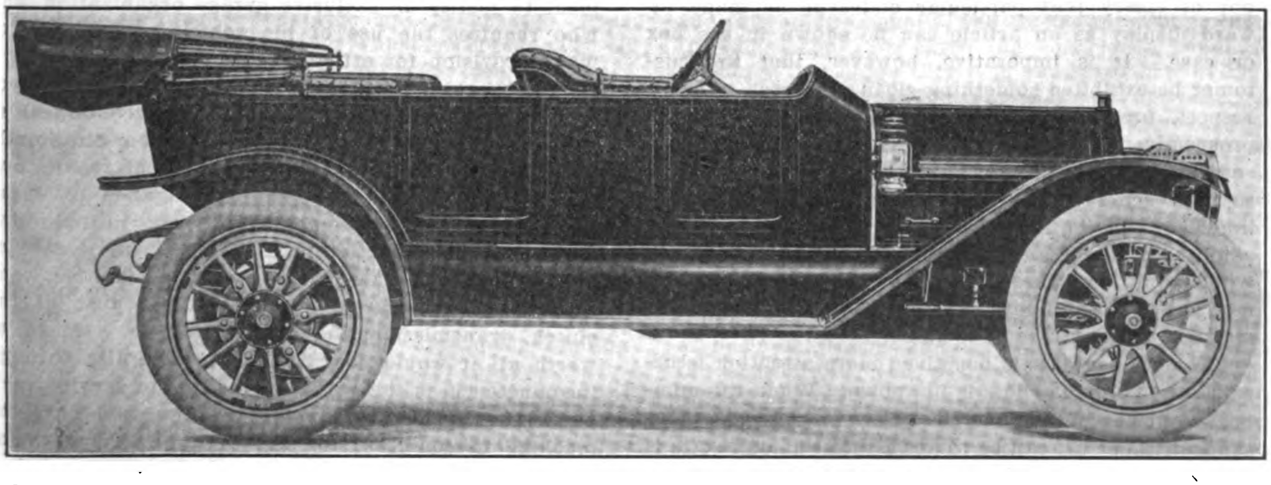
ATTRACTIVE LINES FOR LIVE AGENTS.



Fore View of Model L Velie, 121-Inch Wheelbase, Seven-Passenger Car with Standard Equipment, Made by the Velie Motor Vehicle Company, Moline, Ill.



Reo the Fifth Five-Passenger Touring Car, 30 Horsepower, Price $1055. Made by the Reo Motor Car Company, Lansing, Mich.



New Cutting 1912 Model T-55 50 Horsepower Five-Passenger Touring Car, Price $1850, Fully Equipped. Made by the Clarke-Carter Automobile Company, Jackson, Mich.

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Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. I. NO. 3.

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SYSTEM IN THE CARE OF STOCK.

One of the greatest needs in the average store for the sale of accessories and supplies is systematic care and arrangement of the stock. While desirable it is not necessary that particular endeavor be made toward display as an article can be shown in the box or case. It is imperative, however, that the customer be exhibited something clean and fresh in every respect, for nothing will more quickly discourage a prospective purchaser than badly kept stock.

There is a far greater loss possible through neglect than is generally believed and were there accurate knowledge of the sales where the profit was partly or wholly shrunk because of ordinary inattention to stock, which could be insured against by the exercise of common sense, the amount would surprise the owner or manager of the average business.

That the subject is not given more attention is because the volume of loss is unknown. When the number of places of business is known—there are thousands of them—it can be realized that the aggregate is considerable with each. Here is an admirable opportunity for reform.

SELLING ACCESSORIES FOR ALL CARS.

The makes of cars in existence are numbered by hundreds, and there may be in all many more than 1000 different models in existence. These figures are low instead of excessive. Accessories and articles of equipment are produced in many instances with a view of installation on any car, but frequently special fittings are necessary that an accessory may be utilized. This condition necessitates a very broad knowledge of cars by the dealer or his salesmen, a character of information that is especially valuable and may be utilized to distinct gain in business dealings every day. There are few books of reference that can supply such facts. Comparisons of catalogues of any one make of car for several years will indicate material changes, but few, if any, will give the data necessary for the benefit of the customer. While personal experience may be helpful with some articles it must of necessity be limited. The manufacturers of the accessories may be even less informed than their representatives. Were it possible to collate such information it would meet with ready sale; but it appears impossible to secure it in anything like uniform completeness.

GARAGE SERVICE CHARGES.

With most garages there is a scale of charges for dead storage and another for live storage. The one merely calls for shelter of the vehicle and protection against damage or theft. The other includes in addition washing whenever used, or daily if required, with polishing and the other necessary cleaning, and in some instances locker room or other form of storage. The first class gives the customer exactly what he pays for. The other may include a patron whose work costs more than he is charged, and another whose requirements are exceedingly moderate. To exact a fixed charge for such service is to take an excess from the second and to give it to the first. There appears to be no better method of meeting the condition than by making a fixed charge for storage and others for additional service, which would cause each customer to pay for what he received and would allow a reasonable margin of profit for the garage. The equity of the proposition ought to appeal to all persons, either garage manager or motorists.

POWER WAGON SERVICE.

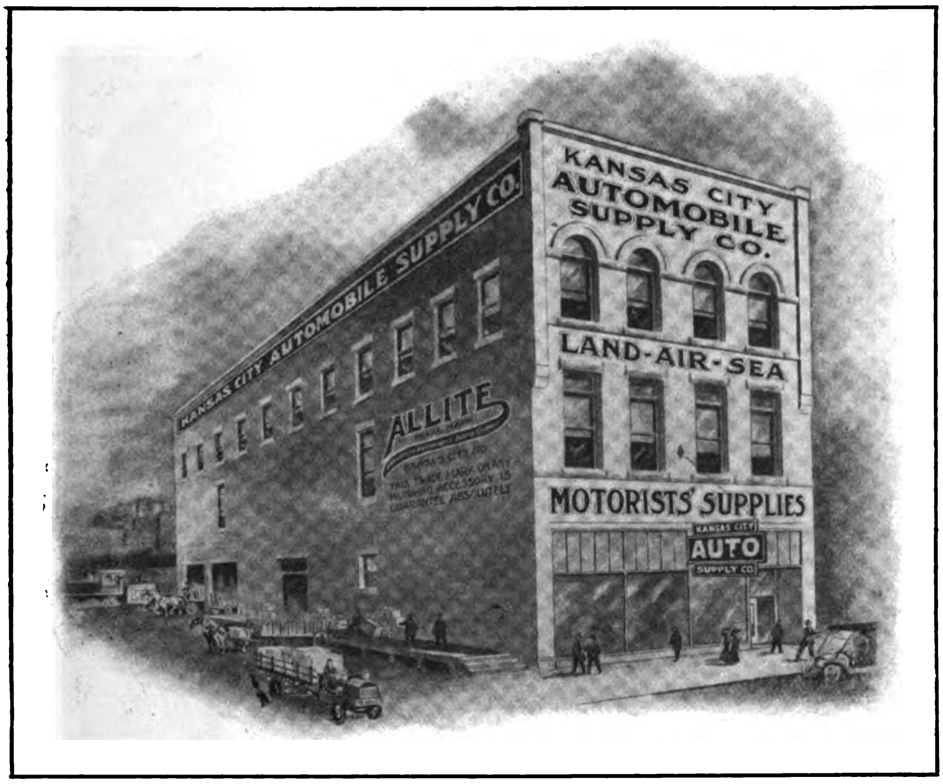
It is entirely practicable for the owner of several service wagons, who does not have a sufficient equipment to justify an exclusive garage organization, and who requires the use of his vehicles constantly, to make provision for attention and maintenance with a reputable garage at reasonable expense. It is not meant that such service would be as economical as were it controlled by the owner, or operated jointly with another, but it would give practical results and certainty of attention. The extravagance of cheap labor is never more emphasized than in operating motor vehicles, and thorough inspection at least once a week and an examination of the mechanism each night (not necessarily minute) and a test of the clutch, transmission and brakes, can be said to be worth all it would cost. Neglect, generally through incompetence, is the worst enemy of the service vehicle. It is cheaper to pay for attention and have the machine in condition for use than to pay more for repairs and rent another wagon during the period of restoration.

MARKETING AUTO ACCESSORIES BY SYSTEM.

Methods Created and Developed by a Large Western Enterprise to Serve a Demand by Long Distance Buyers for Quick Delivery, and Proven to Safeguard All Interests and to Insure Complete Satisfaction.

EVERY industrial and commercial interest studies the "market," which is the opportunity to buy or sell afforded to all people. In buying and selling there are certain business principles that may be universally applied. Systems, methods and conditions differ the world over. It may be assumed that business as transacted by any nation is uniform, but this is far from the fact, and it cannot better be demonstrated than by a contrast of enterprises in two different sections of the United States.

In the East the commercial centres are close together. In these, often but a few miles separated, any person can procure whatever may be desired. This statement is of the rule, to which exception may be made in rare instances. The purchaser can have practically anything delivered at very brief notice; or submitted for inspection. Or, examination can be made without loss of time.


KANSAS CITY AUTOMOBILE SUPPLY CO.
KANSAS CITY AUTOMOBILE SUPPLY CO.
LAND-AIR-SEA
ALLITE
MOTORISTS' SUPPLIES
KANSAS CITY
AUTO
SUPPLY CO.

Main Building Occupied by a Pioneer Enterprise That Is One of the Largest Motor Accessory Houses in America.

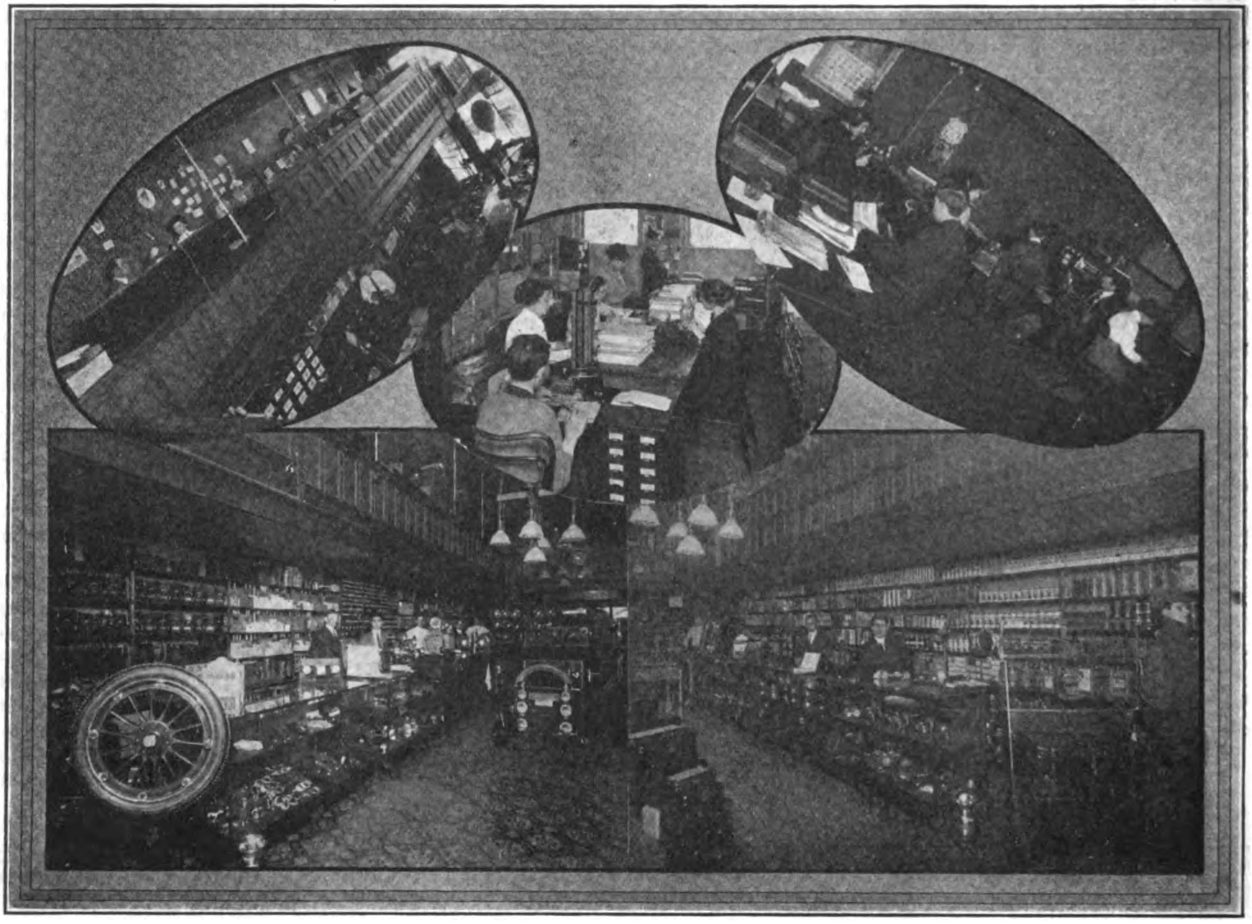
In the West conditions are diametrically opposed. Areas of many thousands of square miles, several states in some instances, are tributary to a commercial centre from which order must be made largely by mail. Shipment is dependent upon the express company or railroad freight. In the East quick delivery is the rule and it must be provided. In the West it is a special service that may mean sending goods hundreds of miles. In the East the buyer generally can make his own selection and he can contrast the best the market affords. In the West he often must choose from a catalogue and trust to the judgment of the house with which he is dealing.

Commercial centres cannot be judged by population. The western method of doing business has been continuance of custom that was begun when the original points were selected by convenience or necessity. This was the cause for the growth of Chicago, St. Louis, Minneapolis, St. Paul, Kansas City, Omaha, Denver, and cities of lesser proportions. No better understanding can be had than by a study of the financial statements by sections and by states. One of the most striking illustrations is the State of Missouri, which transacts more business than any financial centre outside of New York and Chicago, and while Kansas City is 17th in population according to the last census its weekly bank clearings are exceeded only by five cities of the nation. This means that the city is a point of distribution of vast importance. For years it has been the leading commercial centre for farming implements and it has become prominent as a place of distribution for motor vehicles. The enthusiasm of the farmers in good road development and the promotion of the movement by political influence is a certain indication that the agriculturists are becoming more and more independent of the railroads and that there is almost unlimited possibilities for the future in this and similar fields for the automobile and allied interests. It can be said with truth that the farmers now fully realize that the greatest tax in transportation is between their farms and the shipping point, and this is the problem that they must solve.

It is apparent that the business methods generally adopted are not changed to meet any one requirement and this applies equally well to the automobile industry and trade. To serve the very large population tributary to Kansas City it is necessary first of all to have unusual means for publicity and delivery. An admirable illustration of the manner of meeting the requirements is shown by the facilities of the Kansas City Automobile Supply Company, which in the 12 years it has existed has become one of the largest houses of the kind in the West, and is regarded as one of the leading enterprises in the country.

The establishment was the outcome of the endeavors of two prospering bicycle pioneers of Nebraska who removed to Omaha against the advice and counsel of business friends and bankers. After deliberating the possibilities, the business was divided and one interest located at Kansas City, this being the manner of meeting the uncertain development of the country. No matter which city prospered the business was established. After adjusting the affairs to the local conditions these two men, in the opinion of their friends and bankers, became commercial suicides when they were made agents for Locomobiles, for which John Brisbane Walker was responsible as head of the Locomobile Company of America.

The demand for motor cars was nothing and promoting the sale of the machines against prejudice and ignorance necessitated work and required courage seldom needed in coping with business development. When the tide turned it was so overwhelmingly in favor of the Kansas City branch that the Omaha store was given over and the enterprises were consolidated. It was in 1905, when the utility of the automobile became firmly established, that the sale of cars was abandoned and the business was organized into the Kansas City Automobile Supply Company, to deal entirely with motor car accessories. Its dealings are not alone with the United States, but extend to foreign countries as well.



Retail Store and Offices of the Kansas City Automobile Supply Company: Upper Left, a View from the Mezzanine Platform, Showing Separate Cashier and Bookkeeping Divisions. Upper Right, a Corner of Main Office Where the Correspondence Is Answered by Dictators, Phonographs and Typewriters. Centre, Process Letter, "Auto-log" Mailing and Addressograph Department, Whence Literature Is Sent Out the Year Round. Lower Views Show Both Sides of Local Salesrooms.

The concern's magnitude may be judged from the buildings it occupies. In addition to the main structure several warehouses are utilized for the storage of stock. The shipping department is very large and is specially adapted for the work, this being one of the most important divisions of the business. The store is centrally located in the automobile district at 15th street and Grand avenue, the front of the first floor being given over to the retail trade, while the remainder of the structure is utilized for the wholesale distribution. All incoming goods are received either in carload lots from the railroad spur or from the freighting trucks at the rear of the store.

The basement is used for storage, one-half being for oils and greases, a travelling crane and hoist being employed in storing and removal for shipment. The other half of the basement is fitted for the stock of tires, bins being used to separate varying makes of shoes and tubes. The entire second floor is the shipping department, a portion of which is shown in an illustration.

To meet the hurried demands for automobile supplies with prompt service goods are necessarily stocked in unusually large quantities. The system of shipping is with a view of handling all orders the day they are received, and to facilitate packing, shelving has been installed in the shipping room as shown herewith, this being filled with the smaller accessories in greatest demand. The packing tables are built with tops of two-inch plank to endure hard usage and preparing boxes and crates for shipping. These tables are built so the clerks may work at either side and are divided longitudinally by a board. Each side is divided as desired by boards fitted with metal catches which engage the centre board and are held firmly.

With these movable partition boards the table surface may be divided to give any desired spaces and keep all articles in a given section apart from the other orders. As the orders are placed on the table, each in a space by itself, the articles are checked by the clerk, after which the whole is inspected by the chief shipping clerk, an expert mechanic who knows the use of every part or accessory, who double-checks it and then orders the packing. To keep up the stock in the shipping room is the duty of several stock clerks, who draw upon the warehouses as necessary to maintain a standard of supply.

The business of the company is drawn from an exceedingly wide territory, the area extending far beyond the section for which Kansas City is the commercial centre. This necessitates a correspondence division that is proportionate to the volume of mail received and sent out, and naturally this must have re-

View of the Long Double Shipping Bench on Which the Smaller Orders Are Laid Out, Boxed and Packed.

sources and facilities that will enable it to keep pace with any requirements. The system the vogue was carefully developed and perfected with experience, the main purpose being to insure against error in record or shipment and to satisfy all possible demands made with the simplest forms.

Every piece of mail received is marked with a time clock stamp that indicates the minute of the date it was stamped, this being assumed as the precise time of receipt. It is stamped the second time and this stamped form is filled in, as the letter is given attention. First record is made showing by whom it was received, the amount of the enclosure and whether it was a draft, money order or check. Then the stamp provides for three references, showing to whom the letter was referred and by whom the attention necessary in one, two or three departments was given. When the form is filled in and the letter is filed the record is complete so far as the office correspondence is concerned.

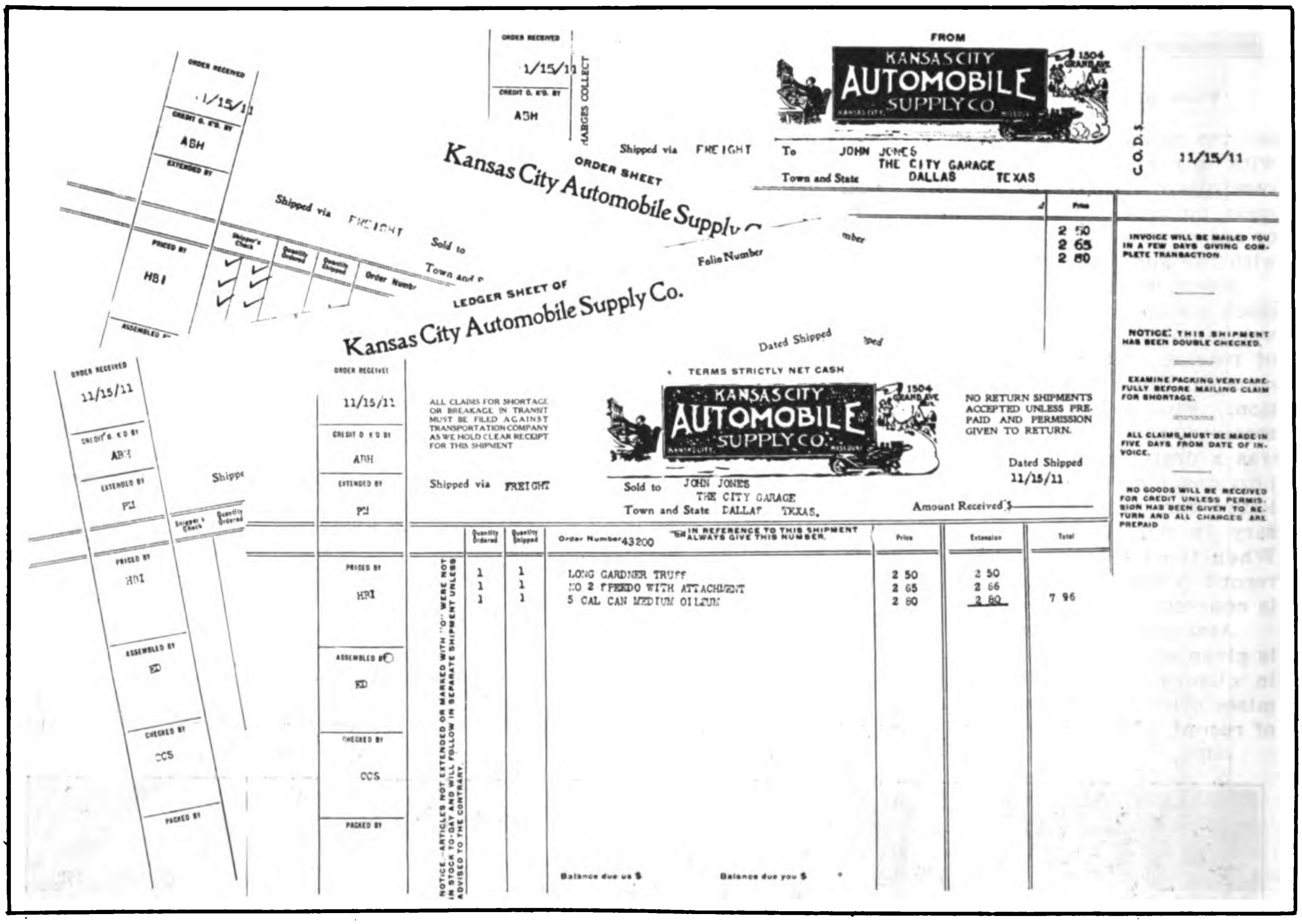
Assuming an example: An order is received and is given attention as stated above. The order is copied in quadruplicate, which insures against error, minimizes clerical work and preserves absolutely the form of record. This order form is very carefully designed and contains every item that is desirable or necessary. The form blank is cut for loose leaf binding and the blanks are with four separate sheets, the first of which is golden rod in color, the second yellow, the third pink and the fourth white. These are 11x7 inches and are written with typewriter and carbon copying sheets. The first, or original, sheet and the second sheet, after the copying, are retained in the office by the bill clerk, and the third and fourth sheets go to the shipping department to the clerk in charge. The third or pink sheet is the actual shipping record and as the order is made up the articles as placed on the shipping bench are checked by the clerk in the first column at the left of the items on the blank. When the chief shipping clerk checks the order he does so in the second column and he confirms or corrects the order as made up. It will be seen that the record establishes who fixes the prices, who assembles the order, who checks it, and who packs it. No order can be packed unless ordered by the chief shipping clerk and his O. K. has been given. When the order is packed, but not closed, the fourth sheet or packing ticket is separated by perforations so that the heading, the shipping direction and the address of the buyer may be pasted on the package or case, this

Section of Stock Room, Showing Shelves from Which Rush Orders Are Filled for the Smaller Express and Mail Shipments.

taking the place of the usual marking and guarding against error by the clerk or illegible marking. The remainder of the fourth sheet is placed in the package and sent with the goods, so that the customer on receipt of the shipment can check the items of the order and fix the prices without waiting for the bill, as well as verifying the character and quality of the articles.

With the shipment of the order the pink or order sheet is returned to the bill clerk and it is assembled with the other two. The prices are extended on all three sheets and of these the first, or original is the invoice, which is mailed to the customer. The second, or yellow blank, is filed directly into a loose leaf ledger this saving the time that would be required to post such an account. The order sheet, from which the order was made up, is filed for record.

The four blanks making up the order form are shown to illustrate the completeness of the record. The first and second are identical save in the heading and that the second is to receive the folio number of the ledger, which number is also given to the third, or order sheet. At the bottom of the order sheet is a note "Items marked 'X' to be back ordered, those marked 'O' not in stock today." At the bottom of the fourth or packing ticket is the note, "Packing ticket from Kansas City Automobile Supply Company, Kansas City, Mo." The difference between the first or invoice sheet, and the instruction to the customer on the packing ticket is apparent. No other condition or requirement appears on the other two tickets.



ORDER RECEIVED 1/15/11
CREDIT O. K'D. BY ABH
CHARGES COLLECT
EXTENDED BY
PRICED BY HBI
ASSEMBLED BY

ORDER SHEET
Kansas City Automobile Supply Co.
Shipped via FREIGHT
Sold to
Town and State
Shipper's Check | Quantity Ordered | Quantity Shipped | Order Number

LEDGER SHEET OF
Kansas City Automobile Supply Co.
Folio Number
Dated Shipped

FROM
KANSAS CITY AUTOMOBILE SUPPLY CO.
KANSAS CITY, MISSOURI
1504 GRAND AVE.
Shipped via FREIGHT
To JOHN JONES
THE CITY GARAGE
Town and State DALLAS TEXAS
C.O.D.$
11/15/11
Price 2 50 2 65 2 80

INVOICE WILL BE MAILED YOU IN A FEW DAYS GIVING COMPLETE TRANSACTION

NOTICE: THIS SHIPMENT HAS BEEN DOUBLE CHECKED.

EXAMINE PACKING VERY CAREFULLY BEFORE MAILING CLAIM FOR SHORTAGE.

ALL CLAIMS MUST BE MADE IN FIVE DAYS FROM DATE OF INVOICE.

NO GOODS WILL BE RECEIVED FOR CREDIT UNLESS PERMISSION HAS BEEN GIVEN TO RETURN AND ALL CHARGES ARE PREPAID

TERMS STRICTLY NET CASH
KANSAS CITY AUTOMOBILE SUPPLY CO.
KANSAS CITY, MISSOURI
1504 GRAND AVE.

ALL CLAIMS FOR SHORTAGE OR BREAKAGE IN TRANSIT MUST BE FILED AGAINST TRANSPORTATION COMPANY AS WE HOLD CLEAR RECEIPT FOR THIS SHIPMENT

NO RETURN SHIPMENTS ACCEPTED UNLESS PREPAID AND PERMISSION GIVEN TO RETURN.

Dated Shipped 11/15/11
Shipped via FREIGHT
Sold to JOHN JONES
THE CITY GARAGE
Town and State DALLAS TEXAS.
Amount Received $

ORDER RECEIVED 11/15/11
CREDIT O. K'D BY ABH
EXTENDED BY PJ
PRICED BY HRI
ASSEMBLED BY ED
CHECKED BY CCS
PACKED BY

NOTICE.—ARTICLES NOT EXTENDED OR MARKED WITH "O" WERE NOT IN STOCK TO-DAY AND WILL FOLLOW IN SEPARATE SHIPMENT UNLESS ADVISED TO THE CONTRARY.

Quantity Ordered	Quantity Shipped	Order Number 43200 IN REFERENCE TO THIS SHIPMENT ALWAYS GIVE THIS NUMBER.	Price	Extension	Total
1	1	LONG GARDNER TRUFF	2 50	2 50	
1	1	NO 2 SPEEDO WITH ATTACHMENT	2 65	2 66	
1	1	5 GAL CAN MEDIUM OILZUM	2 80	2 80	7 96

Balance due us $
Balance due you $

Order Blank of Four Sheets, Copied in Quadruplicate, the First, Shown in Full, Being the Original, and Serves as an Invoice When Extended. The Second Is the Loose Ledger Sheet After Prices Are Extended. The Third Is the Order Sheet for the Shipping Department, Checked with the Order as Packed and Sent Out, and Filed for Record. The Fourth Is the Packing Ticket, the Heading of Which Serves as a Label, and the Remainder Is Packed with the Shipment. Order of Sheets Is from Bottom to Top. Size 11x7 Inches.

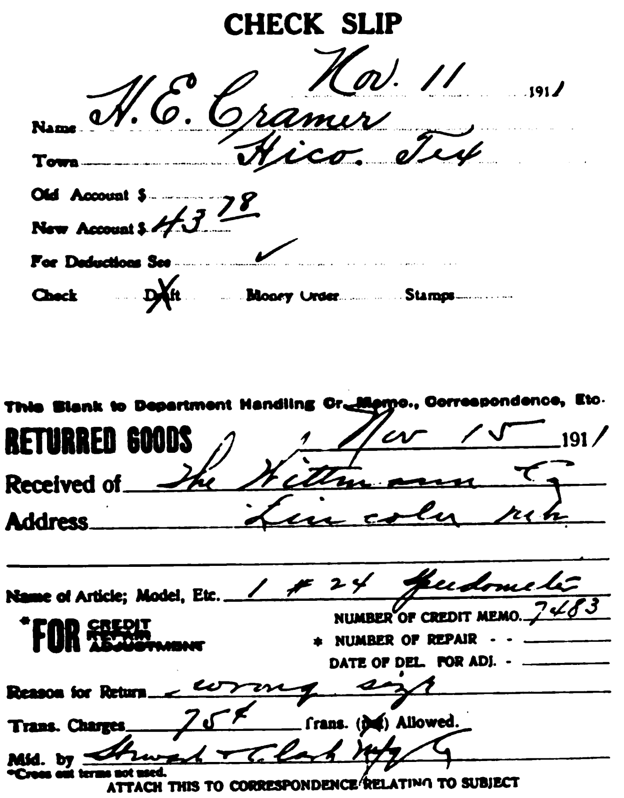
So the returned goods may receive the necessary attention a blank is made out in triplicate, these being in blue, yellow and white, the original being blue. The second has a head note, "Attach this to Goods Returned," and a foot note "All repairs, either for our stock or customer, must be attended to AT ONCE, as any article broken or in only a partial state of repair is USELESS and A LOSS to this concern or its customers." The third has a head note, "This blank to be filed by stock clerk."

As money enclosures are received in the mail a check slip is attached that specifies the form of remittance, the amount, the account, the name and address, with the date, which is to insure against possible delay in handling the order. These slips are filed for record with the orders. With such transactions it is not necessary to carry a ledger account other than to show that the transaction has been closed and as a reference in the event of claim for credit.

All credit memoranda are made out in duplicate, one copy of which is sent to the customer and the other is preserved for office record.

All local sales that are charged are made on a form in duplicate, the purchaser signing each charge as it is made. The bill passes through the billing department and is mailed to the customer, so that each day he will know what has been bought by his authority, and will have a statement of each transaction as made. The copy of the bill is kept for record.

The secret of the success of this business undoubtedly is its system of conducting correspondence. It is an absolute requirement that a letter be answered the same day it is received, it being held that when a customer writes he has reason for so doing and desires quick response. To keep up the correspondence a large battery of typewriters is kept busy during business hours. To economize time of dictators and stenographers phonographs are used, as is illustrated, each dictator answering letters immediately upon receipt while the stenographers can be constantly engaged without interruption by simply changing the



CHECK SLIP

Nov. 11 1911

Name H. E. Cramer

Town Hico. Tex

Old Account $

New Account $ 43 78

For Deductions See ✓

Check [✓ Draft] Money Order Stamps

This Blank to Department Handling Cr. Memo., Correspondence, Etc.

RETURNED GOODS Nov 15 1911

Received of The Wittmann Co

Address Lincoln Neb

Name of Article; Model, Etc. 1 #24 Speedometer

*FOR CREDIT REPAIR ADJUSTMENT

NUMBER OF CREDIT MEMO. 7483

* NUMBER OF REPAIR

DATE OF DEL. FOR ADJ.

Reason for Return wrong size

Trans. Charges 75¢ Trans. (~~not~~) Allowed.

Mfd. by Stewart & Clark Mfg Co

*Cross out terms not used.

ATTACH THIS TO CORRESPONDENCE RELATING TO SUBJECT

Upper Blank, Check Slip Attached to All Money Enclosures, Size 3x5 Inches. Lower Blank, Returned Goods Slip, Made in Triplicate, Original Attached to the Goods, Second to the Correspondence, and Third Filed for Record, Size 3.5x5 Inches.

phonograph records. Even in sealing the envelopes to insure exact and perfect work high speed machinery is employed.

The circular and catalogue department as presented herewith is separate and distinct from the main office. Here is mailed all the literature that is distributed. The department has perfected mailing machines that will turn out 2000 addresses an hour, and others that produce circular letters, etc. The company has no printing establishment of its own as yet, despite the volume of its work. The catalogue is issued annually and is protected in its name of "Autolog" by copyright. This volume consists of more than 200 pages of illustrations, descriptions and quotations of prices on accessories for every form of land, air or sea craft, and it includes as well a fund of information that is valuable to every person, in that it explains simple formulae for computing horsepower, gradients, speeds; the metric system and the English equivalents; proper use and care of tires; methods for tempering, brazing and hardening steels and other metals; how to remove tarnish; how to prevent and remove rust, etc. The "Autolog" is mailed free at request in which is stated the kind of motor the applicant is using.

In purchasing the company is a liberal patron of all leading manufacturers and sales agents and a product new in the market is often submitted for opinion as to its probable success. Buying in large quantities and for cash the customer is given the advantage of the lowest prices that can be established. Every customer is impressed with the policy of satisfaction or the refunding of the price paid. The men who established the first motor car business and the first exclusive accessory house in the entire West are actively interested in directing the company and they have associated with them men who are equally anxious to further develop the field, now so well cultivated.

The purchasing is done by one of the organizers of the company who is careful never to take on any line that will not yield the customer full value for the price paid. This care in selection of stock and the financial responsibility of the concern has given it prestige and impelled the confidence of the motoring element of the section in which it does business. The members of the company are emphatic in their belief that the "square deal" has been the best and surest foundation on which they could have builded. This has been demonstrated practically in many instances where orders have been received and the judgment of the house depended upon entirely.

TIGHTENING WOBBLING REAR WHEEL.

A small, low priced runabout came into the garage one day with a rear wheel so loose on the axle that when it was jacked up it displayed an enormous amount of side shake. The axle was fitted with a long, square key to drive the wheel. This was prevented from coming off by a .375-inch pin through the hub and shaft, which were both so badly worn that new members seemed almost necessary, but after looking the job over a method of repair was evolved.

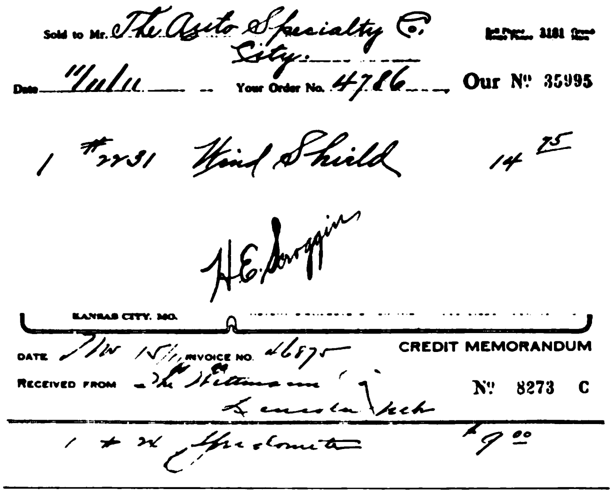
The shaft was turned down .0625 inch for the length of the hub. The latter was removed from the wheel and bored out the same amount, leaving room for a .125-inch bushing. This was made from steel tubing and brazed into the hub. The keyway was cut through the bushing to coincide with that in the hub, the one in the shaft deepened, and both widened to fit a new key. Then the wheel was assembled, placed on the axle, the pinhole drilled through the bushing, reamed, and a new pin driven in, after which the whole was as firm as when new.

CLEANING SHELLAC BRUSHES.

A shellac brush may be cleansed readily and easily in soap and water if it be taken in time and the work done quickly, before the shellac has had time to set. Alcohol is generally used for this purpose because of its cutting action on the gum, which is the principal ingredient.

DETECTING LEAKS IN FUEL TANK.

Minute leaks of the fuel tank are hard to locate because the gasoline evaporates so quickly and the amount is too small to detect readily with the naked eye. Where one is thought to exist it can be located by mixing a quantity of cylinder oil with the fuel. This will remain upon the metal near the hole.



Sold to Mr. The Auto Specialty Co. City. [illegible] 3181 [illegible]

Date 11/11 Your Order No. 4786 Our No. 35995

1 #2231 Wind Shield 14 75

H E Scoggins

KANSAS CITY, MO.

DATE Nov 15/11 INVOICE NO. 26875 CREDIT MEMORANDUM

RECEIVED FROM The Wittmann Co Lincoln Neb No. 8273 C

1 #24 Speedometer $9 00

Upper Blank, Bill for Article Locally Delivered and Charged, Made in Duplicate, the Purchaser Signing Each Charge as Made, Size 6.5x8.5 Inches. Lower Blank, Credit Memorandum, Made in Duplicate, One Copy Sent to the Customer and the Other Retained for Record, Size 7x8 Inches.

PRACTICAL GARAGE ACCOUNTING.

System Created For a Four Department Automobile Business That Stopped Shrinkage and Loss and Gave Accurate Knowledge of the Transactions in Each Division, Showing Fixed Charges, Gross and Net Profits.

THAT the application of system in the administration of the public service station will result in substantial saving and improvement of attention to patrons is certain. In selecting a method to be adapted, that having the least complications and which will yield results is to be preferred. Theory is well enough but the average man desires to know what has been accomplished, and to give this character of information, detail has been sought that has been applied and has been employed for a sufficient length of time to justify a recommendation of its use.

The following system was developed and applied to a garage service in a city of moderate proportions. This business was conducted for several years in much the same manner as are hundreds of others. The transactions had justified development and the investment of capital, but with the best of facilities for service of every kind and a location that attracted a relatively large volume of transient patronage the net return was not satisfactory. The actual loss was apparent and the creation of rules made no material change. It was believed that there was a much greater earning power than was indicated by the balance sheets, and that there was shrinkage was obvious.

With a purpose to absolutely fix responsibility and to keep certain record of every department and transaction analysis was made and the system below was developed. It has proven to be satisfactory in every way.

The business is divided into sales, supplies, garage and repair departments. Each is conducted as though it were entirely independent and each must be made reasonably profitable. In the bookkeeping each department is apportioned its share of fixed charges, which include rent, interest, light, power, water, heat, advertising, office expense and salaries. This apportionment is an approximation based on the expense of the previous year, averaged for each month and for each item. At the expiration of any given month the actual expense can be compared with the average, or with any previous or corresponding month. Any material change can be a reason for inquiry and adjustment, if this be necessary. This insures against any continuance of a loss.

Each month a summary is made which includes 13 totals of items. The first column is that of the cash revenue from storage of cars, labor, battery charging, and sale of gasoline, oil, tires, parts, accessories and cars; the second, of charges made of similar transactions; the third is the total revenue from each source, which ought to equal the totals of the first two columns; the fourth shows the expenditure charged against each item; the fifth, the difference between the receipts as shown in the third column and the expense as shown in the fourth. These totals, the third, fourth and fifth, show gross and net revenue and expense, which is applied to the entire business. The sales, supplies, garage and repair departments each then are shown in four additional columns by receipts and expenditures as indicated by the items of revenue in the first five columns, the footings giving the total receipts and expenses for each department. The combined footings should equal the totals of gross revenue and expense, and the difference between the two should be as shown by the net total revenue. With this statement of revenue and expense the average of fixed charge for each department may be contrasted, and the proportion for each determined. Comparison with any previous month may then be made and the difference in actual figures or with the average of fixed charge is indicated. The condition of each department is shown beyond question.

	Cash Sales	Charge Sales	Total Sales	Cost	Net Receipts	Sales		Supplies		Garage		Repairs	
						Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Storage	$100	$150	$200	$50	$200					$250	$50		
Gasoline Sold	85	15	100	90	10					100	$90		
Oil Sold	25	10	35	25	10					35	25		
Tires Sold	250	50	300	200	100			$300	$200				
Labor	400	175	575	325	250							$575	$325
Battery Charging	25	10	35	20	15					35	20		
Parts Sold	80	20	100	65	35							100	65
Accessories Sold	250	70	320	195	125			320	195				
Cars Sold	7200		7200	5965	1235	$7200	$5965						
	$8,415	$500	$8915	$6,935	$1980	$7,200	$5965	$620	$395	$420	$185	$675	$390
Gross Earnings							1235		225		235		285
Payroll							100		40		100		75
Charges (Approximate)							350		80		65		130
Net Profit							$765		$105		$70		$80

Example of Summary Sheet, Showing Transactions, with Cost, Gross and Net Receipts, for Each Department and for the Entire Business, the Fixed Charges and the Net Profits, for a Combination Agency and Garage.

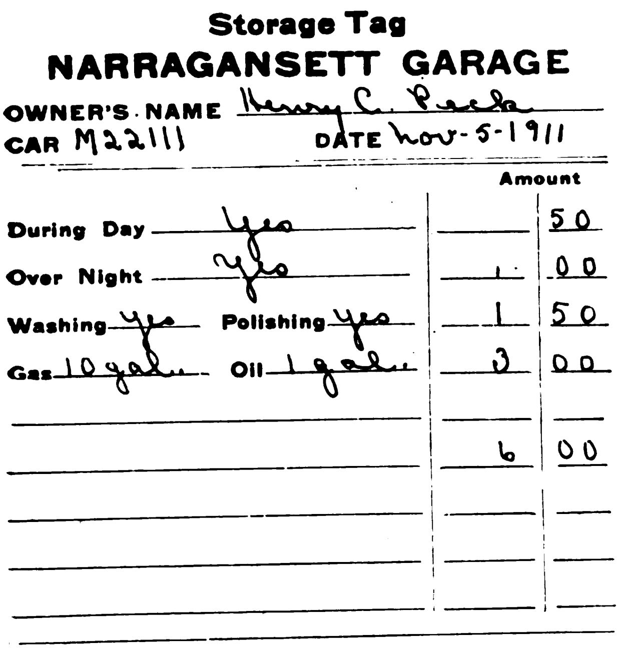
That the summary may be understood, a form has been filled out as illustration, but the figures must not be understood as being anything more than an example. It should be stated that item "sale of cars" indicates merely the difference between the cost and the selling price. When the summary has been made and the gross earnings have been obtained the payroll of and the averaged fixed charge for each department is deducted, which gives the net profit for each separate division of the business. It is then possible to ascertain where there is loss or shrinkage.

In connection with the use of this sheet it must be realized that the condition of the stock is in one sense a potent factor, and in another it is not. To illustrate: All charges are made on the basis of the selling price and the cost at invoice or inventory valuation so far as stock is concerned. The stock record shows the condition, shrinkage or increase, so far as relates to capital invested in stock, but at the other hand this has no bearing on the volume of business, because the profit is based on the actual transactions and whether the stock be large or small this is taken care of in the item of fixed charges. However, the net profit of the department ought to have a definite relation to the fixed charges.

It will be seen that it is possible each month to give summary of the volume of business transacted, department volume of business, the total revenue and the department revenue, the total expense and the department expense, the department fixed charge, and department incidental expense and renewal expense.

In the garage department the sale of oil, gasoline, waste, carbide, grease, and the like, and the storage, washing and polishing, are sources of revenue. The labor and the parts sold are credited to the repair department; the sale of tires and accessories, to the supplies department, and the sale of cars, to the sales department.

In the bookkeeping there is a ledger account for each department, and in this is charged all the expense for each division. To the credit is placed all the earnings. The balance indicates the profit or loss. The sales for each day are posted to the credit of the department, but in the sales department total sales and the total cost are the principal items of record. In the sales department the demonstration expense, telephone and telegraph charges, railroad fares, time of the drivers in receiving or delivering cars, oil, grease, waste, carbide, labor, adjustments, repairs, etc., are all charged to the department in addition to the proportion of the fixed charge, and the difference between the selling price and the total expense is the net profit. An account is opened with each car in the ledger and the charges for expense are made at cost or an approximation that is very close.



Storage Tag

NARRAGANSETT GARAGE

OWNER'S NAME Henry C. Peck

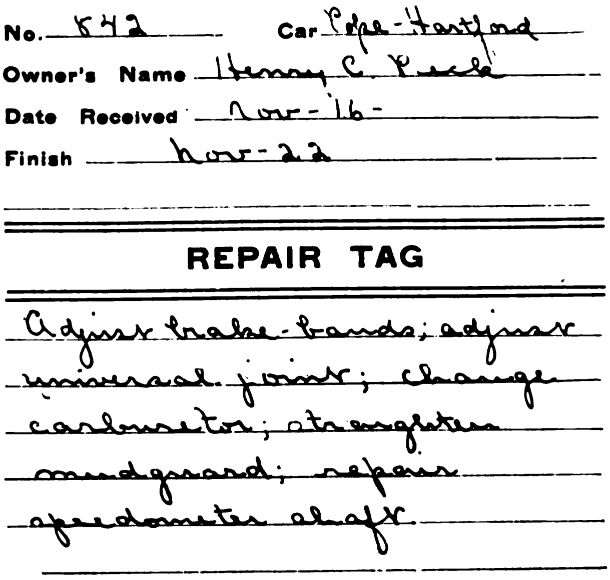
CAR M22111 DATE Nov-5-1911

		Amount	
During Day	Yes		50
Over Night	Yes	1	00
Washing Yes	Polishing Yes	1	50
Gas 10 gals.	Oil 1 gal.	3	00
		6	00

Form 1, Storage Tag.

The conduct of the business is to be approved in that there is endeavor made to attract attention to every service. The accessory department is large and well lighted. There is a large window where display is made and changed weekly. Standard and special stock is shown. All the goods are protected by cases from handling and from dust. Where it is possible the stock is tagged and marked plainly, these tags being turned into the cash register when a sale is made, this giving information for replenishment orders and where factory and order number are essential these are placed on the tags. This makes possible frequent ordering and the maintenance of the stock to the desired volume.

In the garage all sales are recorded by sales slips with carbon copies so as to indicate both cash and charge transactions. The gasoline is distributed to the cars by a portable tank with meter and this meter must coincide with that of the main supply tank, as well as with the slips by which the sales are recorded. The oil in bulk is kept in a battery of pump tanks while the oil in cans, grease, waste, carbide is kept in a storeroom under lock and key and is in charge of the head of the accessory and supply department.



No. 842 Car Pope-Hartford

Owner's Name Henry C. Peck

Date Received Nov-16-

Finish Nov-22

REPAIR TAG

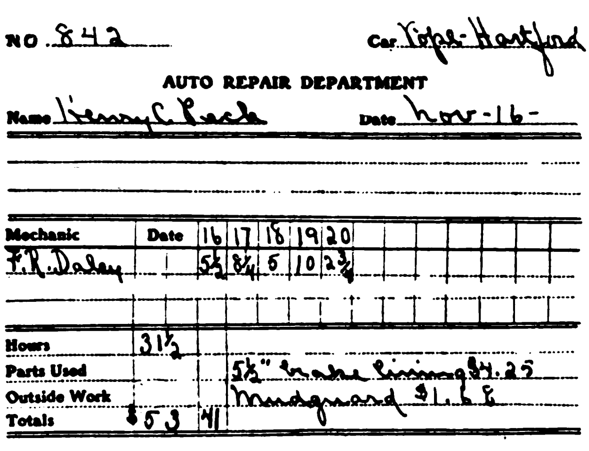
Adjust brake-bands; adjust universal joint; change carburetor; straighten mudguard; repair speedometer shaft.

Form 2, Repair Tag, Reverse of Storage Tag.

The tires, gas tanks and the special preparations prepared for sale under the name of the garage, as well as the stock that cannot be kept in the salesroom, are kept in a large storeroom, the tires being arranged as to makes and sizes, each article being in bins or compartments or on shelving.

As to the record of service: In the event of a transient customer the storage tag as shown at Form 2 is filled out and attached to the car. This specifies the character of service and against each item is placed the charge and the total is then made. When the car is delivered to the owner the tag is removed and the cash payment is shown by the sales slip, a copy of which or a receipt, as may be desired, is given the owner or driver.

Should repair be needed the reverse of the storage tag is filled in with the identification and the necessary instruction. This done the car is turned over to the superintendent for his attention. This tag is designated as Form 3. When the car is received by the foreman of the repair department a record is begun that is continued with the different stages of the work, this being on a form on which the original instruction is transcribed with such additional detail as



NO. 842 Car Pope-Hartford

AUTO REPAIR DEPARTMENT

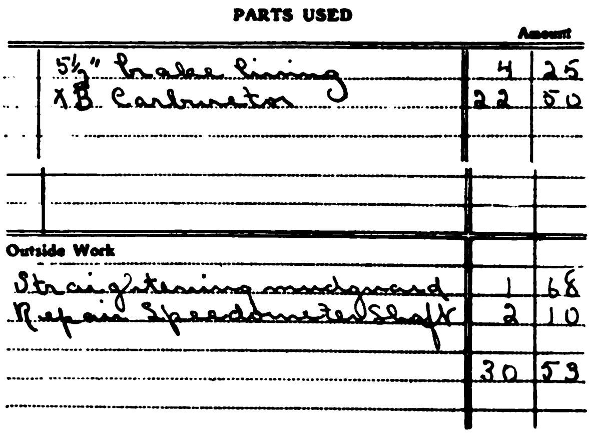
Name Henry C. Peck Date Nov-16-

Mechanic	Date	16	17	18	19	20
F. R. Daley		5½	8¼	5	10	2¾

Hours	31½		
Parts Used			5½" brake lining $4.25
Outside Work			Mudguard $1.65
Totals	$53	41	

Form 3, Foreman's Record, Both Sides of Card.

is necessary to describe the attention to be given. This is shown as Form 3 and on it is noted the name of the mechanic, the dates and the number of hours of work each day. On the reverse of the form the record is continued under a summary which includes the hours of labor, every component supplied from the stock room under "parts used," and "outside work," which defines whatever may not have been within the facilities of the garage shop. This also indicates the total number of hours of labor, value of parts used and of outside work, together with a total for each day and for the entire job, when the record is returned to the office with the notification that the car is ready for delivery. This record is compiled by the foreman on the blank indicated as Form 3.



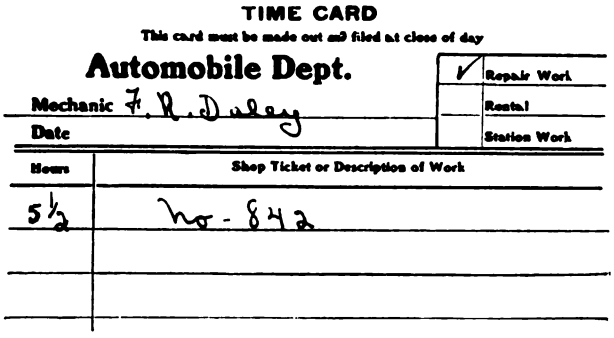
PARTS USED

	Amount	
5½" brake lining	4	25
XB Carburetor	22	50
Outside Work		
Straightening mudguard	1	68
Repair Speedometer Shaft	2	10
	30	53

Form 4, Reverse of Form 3.

Each workman keeps account of his time under the direction of the foreman and each day the time cards are collected and sent to the office. The cards are grouped with reference to each job of work and these must coincide with the record of the foreman. The form of time card is shown as Form 5. The repair blank as completed is a bill in itself, from which the bill is made up and passed upon before being sent to the customer. If the bill is paid immediately this is recorded by the sales slip, a copy of which is given as a voucher with the receipted bill, there being two records for the customer and the office instead of but one. The form of the sales slip is seen as Form 6.

With the cars in live storage a sales slip is made out with each replenishment of the tanks or supply furnished, and as these are sorted and filed in order and charges are made from them daily, any inattention may be established without question. A gasoline and oil schedule with account for every day of the month is made out for each car, and entry is made on the schedule whenever the tanks are filled. This is original and is kept on file, it being a check on the sales, but a copy is sent to the owner for verification of the items entered on the bill. This shows gasoline in gallons, cylinder, high speed, and gearcase oil in quarts with incidentals and the total value. From these slips the charges are made monthly. Where the business has cars in the garage or work is being performed on them storage or any other item of expense is charged at cost, as has been stated. A specialty is made of repair work on the cars for which the business is agent.



TIME CARD

This card must be made out and filed at close of day

Automobile Dept.

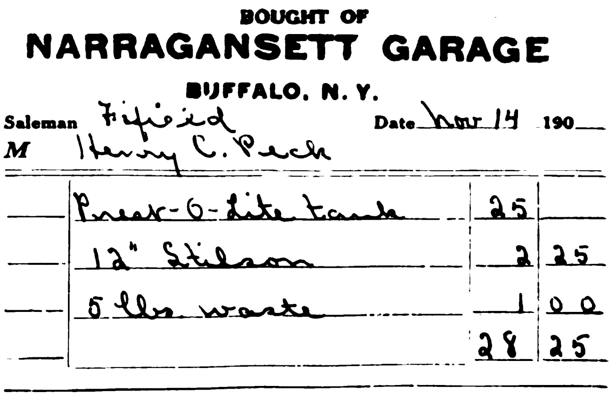
Mechanic F. R. Duley

Date

☑ Repair Work
☐ Rental
☐ Station Work

Hours	Shop Ticket or Description of Work
5½	No - 842

Form 5, Time Card for Workmen.



BOUGHT OF

NARRAGANSETT GARAGE

BUFFALO, N. Y.

Saleman Fifield Date Nov 14 190

M Henry C. Peck

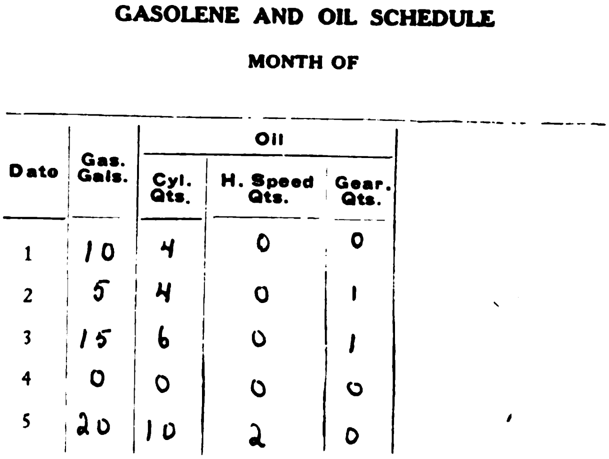
Prest-O-Lite tank	25	
12" Stilson	2	25
5 lbs. waste	1	00
	28	25

Form 6, Sales Slip.

All of the owners of cars stored are required to keep their property in lockers, and no responsibility for private property is assumed. It is held that accountability and responsibility are imperative and that it is best to keep the cars of transients under lock and key where they cannot be reached even by the owner or driver without the knowledge and presence of the superintendent of the garage. Care has been taken in the employment of help to select as good men as can be found and pay good wages, for when men value their employment there is less possibility of visitations by their friends, the unprotected property being an attraction. The installation of a system also insures against loss or shinkage in the stock room. No commissions are given to drivers and it has been the experience that this attitude has the approval of the owners. There has been no reaction because of this policy.

STICKING GASKETS.

Where asbestos and some other materials are utilized for gaskets they are apt to stick to the metal and upon overhauling must be scraped off. This means making new members and a loss of time and a source of expense to the owner. A tight fit may be made by rubbing the packing and metal parts with dry graphite. This is not affected by heat and will allow the gaskets to be removed as a whole.



GASOLENE AND OIL SCHEDULE

MONTH OF

Date	Gas. Gals.	Oil		
		Cyl. Qts.	H. Speed Qts.	Gear. Qts.
1	10	4	0	0
2	5	4	0	1
3	15	6	0	1
4	0	0	0	0
5	20	10	2	0

Form 7, Gasoline and Oil Record, Boarders' Cars.

When asbestos is leaded it should be laid flat upon a smooth surface and handled carefully as it tears easily.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

REMOVING FROZEN TIRES.

Few automobilists remove the tires from the wheels unless obliged to through a puncture or a blow-out. Where the members have been on the machine for several thousand miles and the car operated over wet and muddy roads without the casing being taken off, the task is frequently difficult.

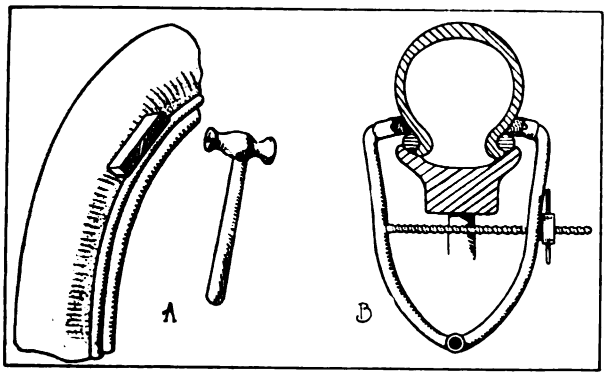


Fig. 1—Some Tire Removing Hints: A, Using Block and Hammer; B, Clamp for Starting Shoe Frozen to Rim.

The writer noted an instance of this kind recently. The car was one of the popular type, fitted with large shoes, and its owner had driven the machine something like 4000 miles since its purchase without touching the front tires. One of these picked up a small nail the point of which gradually worked through to the inner tube puncturing the latter.

Upon attempting to remove the envelope it was found to be frozen to the rim and although different forms of tire tools were tried none started the shoe. Another motorist whose automobile was equipped with the Fisk bolted-on type, solved the problem with the tool used in connection with this make and illustrated at Fig. 1 B. The device consists of two hinged jaws operated by a threaded bolt and a turnbuckle.

Two smooth blocks of hard wood about three inches in length, were placed, one on either side of the tire and in proximity to the rim, as shown in the sketch. The jaws of the tool were compressed slowly which forced the bead of the shoe away from the metal. The instrument was reversed and the other side of the casing separated from the rim.

Having started the casing, one of the blocks was placed against that part of the tire which was still frozen and several sharp blows struck with a hammer as depicted at A. Care should be taken to remove all sharp corners from the wooden members.

Upon attempting to remove the inner tube from the shoe it also was found to be frozen and the operator in trying to force the members apart tore the tube badly. The tube evidently had been placed in the casing without the latter being treated with talcum powder. By a liberal application of gasoline and careful handling the tube was separated from the shoe. The same conditions existed with the other front member and the process of removal would have been difficult on the road, especially at night. Before replacing, the rims were cleaned thoroughly and smeared with graphite. Although tire makers advise removing the shoes and cleaning the rims at stated intervals, this work often is neglected.

DOUBLE ACTING GASOLINE MOTOR.

A hydrocarbon motor, the power of which is varied by the amount of mixture admitted at constant pressure, and the mechanism of which gives two explosions every revolution with only a single working cylinder, has been brought out by the Holmes Engine Company, London, England. The inventor claims that he can make it weigh as little as one pound a brake horsepower, also obtain economy of fuel owing to the gas always being burned at the most efficient degree of compression.

At Fig. 2 is presented a sketch of the device and it will be noted that the main or working cylinder is equipped with a piston which is of the steam engine type and has two ports. The piston rod passes through a special form of gland, which is not indicated in the drawing, and below is attached to another piston of similar size operating in a separate tandem cylinder. Leading from the lower piston is a connecting rod attached to an ordinary single throw crankshaft. The office of the lower piston is that of a pump, compressing as it does, mixture into a separate chamber where it is stored at a considerable pressure.

At the side of the main cylinder there is a hollow piston valve and it may be explained that the burnt gases from the explosion chamber pass through the ports and over the ends of the valve and move out at the two exhaust ports. Inside the piston valve, however, there is another piston, which also moves, uncovering the inlet port and allowing the mixture stored in the reservoir to pass into the top and bottom ends of the hollow valve, respectively.

These charges are trapped for a brief period, and by the movement of the outer valve the transfer port registers with either of the ports of the main cylinder, and the piston inside the valve rises as the working piston descends, thus transferring the charge to the combustion chamber.

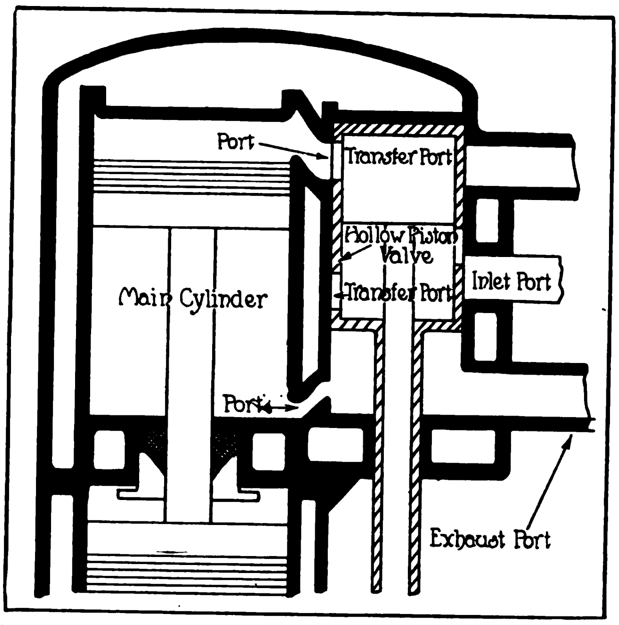


Fig. 2—Double Acting Gasoline Motor Which Gives Two Explosions Every Revolution.

Both the outer valve and inner piston are operated from eccentrics, and are given variable speed by means of combination of a Stephenson link motion with a cam gear. Its operation transmits the desired motions to the valves, with the additional advantage that the travel can be controlled, thus varying the cut-off of the intake. The result is to allow either large or small charges to be passed into the main cylinder. When these are large the working piston is some way down on its stroke before ignition takes place, while with a small amount it may be near the top, owing to the fact that the piston in the valve only transfers the charge to the main cylinder, and that firing takes place always just as soon as this movement is complete, the compression at the instant of explosion being constant at all times. Some details are not exactly clear, owing to the fact that the inventor is withholding full description until patents have been secured.

DRILL AND REAMER HOLDER.

A useful and easily made drill socket designed for holding straight shank and broken drills, reamers and similar tools, is shown at Fig. 3. It is so designed and constructed as to take adapters, permitting of the use of drills of various sizes. The former are turned from a piece of cast steel and may be made with a tapered shank on a square section member, the latter being suitable for use with a ratchet brace.

A recess is bored in the holder, as indicated by the dotted lines, either for the fitting of the shank of a drill or to take the various split adapters. The loose collar which fits the outside of the holder is drilled, countersunk and tapped for a square headed set screw. This is slipped over the end of the holder, and the screw tightened, which operation presses the latter against the recess of the former and causes it to grip either the drill or one of the adapters.

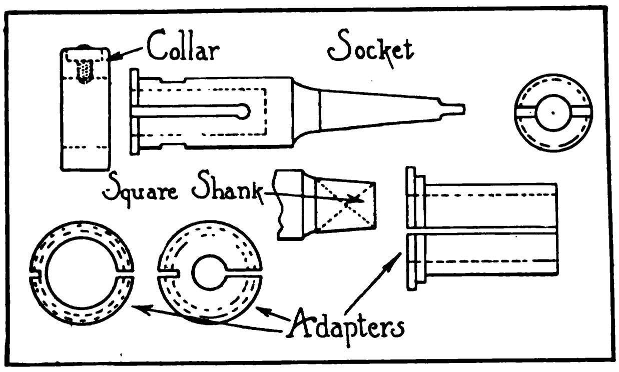


Fig. 3—Socket for Holding Broken Drills and Reamers.

The latter should be constructed of mild steel and as many can be made as required. They are completely divided at one side, and partly slotted at the other, this being done for the purpose of allowing them to be closed easily when pressure is applied on the outside holder. The slots of the former should always coincide with the latter.

COMBINATION VALVE GRINDER.

In grinding valves it is essential that the tool utilized should be given an oscillating motion to obtain the best results. Some repairmen use an ordinary carpenter's bit stock, and when this is equipped with a ratchet, it is necessary to shift the device to obtain a reverse movement. Even with the average breast drill it is not possible to oscillate the valve, but a continuous turning movement must be given, and this is not only bad for the valve seat, but pushes the grinding medium to one side, so that it must be renewed frequently during the operation.

At Fig. 4 is depicted the Ashcroft combination valve grinder brought out by Brown Bros., Ltd., London, England. By means of an ingenious automatic clutch action the flat nosed tool, similar to a screwdriver blade, within the chuck can be made to oscillate within an arc gradually advancing to the right, even though the handle operating the tool be turned continuously in one direction. This advancing of the arc oscillation prevents, it is claimed, the formation of grooves in the valve or seat.

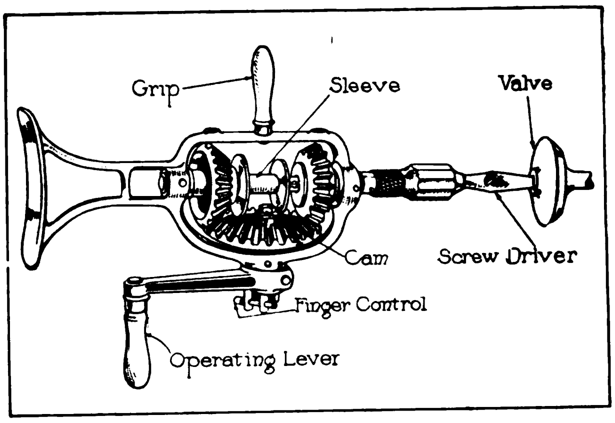


Fig. 4—New Form of Valve Grinding Tool.

If required, the tool can be used as a breast drill by adjusting the finger control at the end of the handle shaft and placing the cross pin in one of the slots provided. By securing the former in another alternative position the device can be used as a ratchet, with either right or left hand movement, and in such form is useful for removing or inserting screws in awkward positions, and for drilling and tapping places where a full swing of the operating crank cannot be obtained.

The oscillating movement is obtained by the centre sleeve being thrown from one end of its shaft to the other and into engagement with ratchet keys at either end. This movement of the sleeve is caused by the plate cam which is fixed to the handle shaft, and at certain points in each revolution moves the sleeve to one end or the other, thus causing the drive to take place through two small bevel pinions alternately.

EMERGENCY WHEEL PULLER.

It rarely happens that a rear wheel must be removed while on the road, but when such is the case, and where it cannot be taken off easily, a wheel puller not being available, it is possible to utilize the hub cap as shown at Fig. 5. A small block of wood is inserted in the cap which is partially screwed up on the hub and a further movement will start the wheel.

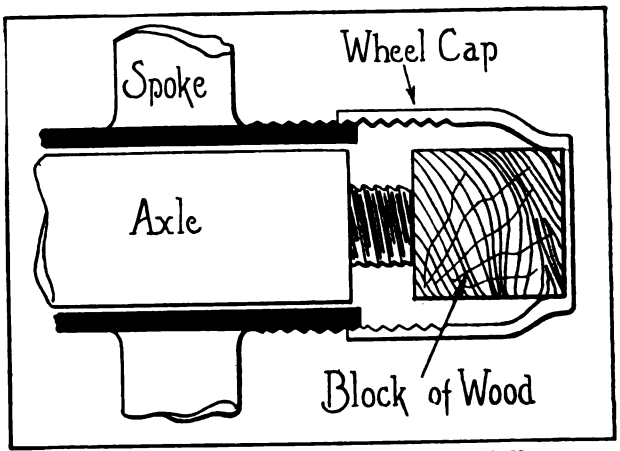


Fig. 5—Utilising Hub Cap as a Wheel Puller.

This method is not to be recommended where the metal is light, nor should undue strain be brought to bear. When the wheel is stubborn it can be started by a few smart blows with a hammer on the cap.

UNIVERSITY OF CALIFORNIA

TIRE INFLATING DEVICE.

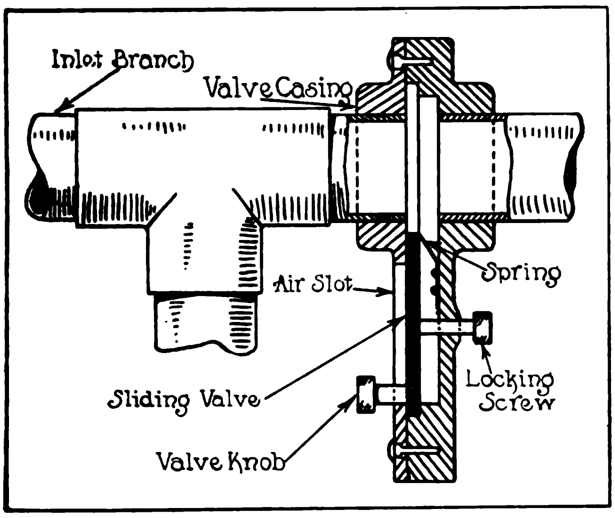


Fig. 6—Tire Inflating Device Incorporated in the Intake Pipe and Operated by the Motor.

Various methods are utilized to relieve the motorist of the arduous work of pumping up pneumatic tires, a disagreeable task at the best even in cold weather. There are many devices upon the market, the majority of which store compressed air, while others employ the energy of the motor to drive some form of pump.

In the sketch presented at Fig. 6 is an appliance invented by an English motorist which is said to be entirely successful and a feature claimed for it is that after installation there is no expense attached in its operation. The principle of the tire inflator is that of the pump, the piston of one cylinder of the motor compressing air and forcing it through a check valve and tube to the tire.

To prevent mixture being drawn from the carburetor a sliding valve is incorporated in the intake pipe leading to the cylinder employed. This valve moves freely in a slot and is fitted with a spring as depicted. When the mixture is to be cut off from the vaporizer the valve is moved upward and locked by a screw which operation closes the intake member. This movement opens an air slot which communicates to that portion of the intake pipe leading to the combustion chamber of the cylinder.

The other fitting is a non-return or check valve which is fitted to the exhaust valve cap of the same cylinder. This may be equipped with a shut-off cock similar to a compression member, for the purpose of closing the part completely. A copper tube is attached and carried to some convenient part of the chassis. A rubber tube is fitted and provided with the usual device for screwing to the threaded member of the tire valve. A wire gauze filter is incorporated either in the check valve or piping to prevent any particles of carbon or foreign elements being carried into the inner tube.

The action is as follows: When a tire is to be inflated the tube is fitted to the member and the motor started. The sliding valve is then raised by means of the knob and locked. Air is drawn in through the opening described and passes into the cylinder. On the compression stroke this is forced through the check valve and piping to inner tube. The device is applicable to multi-cylinder motors.

MONKEY WRENCH PIPE CUTTER.

Sometimes in the repair of old cars it is necessary to fit new piping. The usual method of cutting is with a hacksaw which involves considerable labor. A simple tube cutter and one that is inexpensive and made easily is shown at Fig. 7 A. It consists of an ordinary monkey wrench to which cutters are fitted. These steel discs can be obtained at any hardware store for a few cents. A small hole is bored through each jaw of the wrench and a stove bolt passed through the disc and tightened. A little space should be allowed for the latter to turn. To cut different sizes of pipe, it is necessary simply to adjust the jaws.

FILE PIPE WRENCH.

Utilizing a Stillson on brass or copper piping is bad practise as it will mark or cut the metal. A handy pipe wrench can be made from an old file and it has an advantage over the former tool as it will not injure the tubing. An old 12-inch half round file should be chosen and ground fairly smooth on the flat side; just enough to remove the points of the teeth for a short distance. Next, the end should be annealed and bent into the shape shown at Fig. 7 C. The size of the curve will depend upon that of the tubing. A file bent around an inch pipe will take three-quarters. A hole is next drilled and tapped to take a long set screw. This device will hold brass or copper tubing securely in a very effective manner.

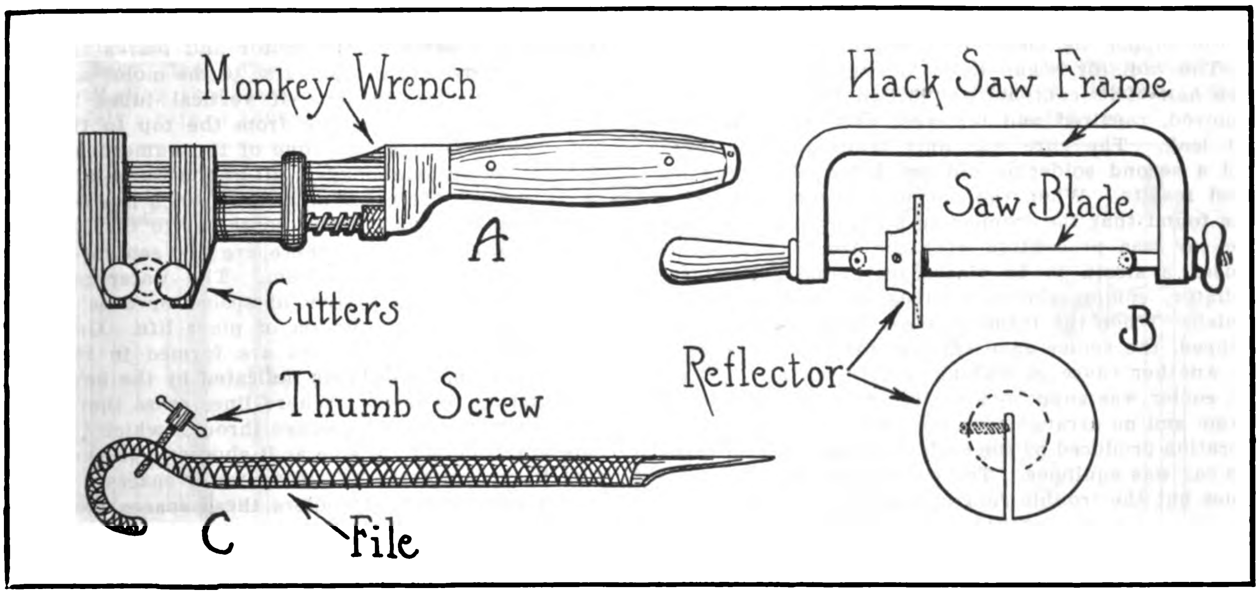


Fig. 7—Some Repair Shop Hints: A, Pipe Cutting Attachment for Monkey Wrench; B, Reflector for Hacksaw Blade; C, Pipe Wrench for Brass or Copper Tubing.

HACKSAW REFLECTOR.

Occasionally the repairman is called upon to use the hacksaw where the light is not good and when such is the case it is difficult to cut to the line scribed. At Fig. 7 B is presented a device that is made easily and will facilitate the work. It consists of a round disc of sheet brass or light metal, which is turned so as to have a collar at the back. A slot is cut through the centre allowing it to slip over the blade of the saw. The reflector is held by a .1875-inch set screw and enamelled white.

WHY SOME RADIATORS LEAK.

It is not an uncommon occurrence for some radiators which have been in service but a few months to begin leaking. Sometimes this begins before the installation of an anti-freezing mixture, and even after the cooler is repaired fluid finds its way through some opening. Usually the operator condemns the work of the repairman, thinking that the latter was at fault.

This may not be the case as other conditions may have been responsible for the loss of fluid. The trouble may be due to a bent or broken frame which brought about conditions similar to those depicted at Fig. 8 A. This radiator was supported by a metal band fastened to the frame by bolts. The cooler was held by studs integral with the former and secured to the supporting member by nuts.

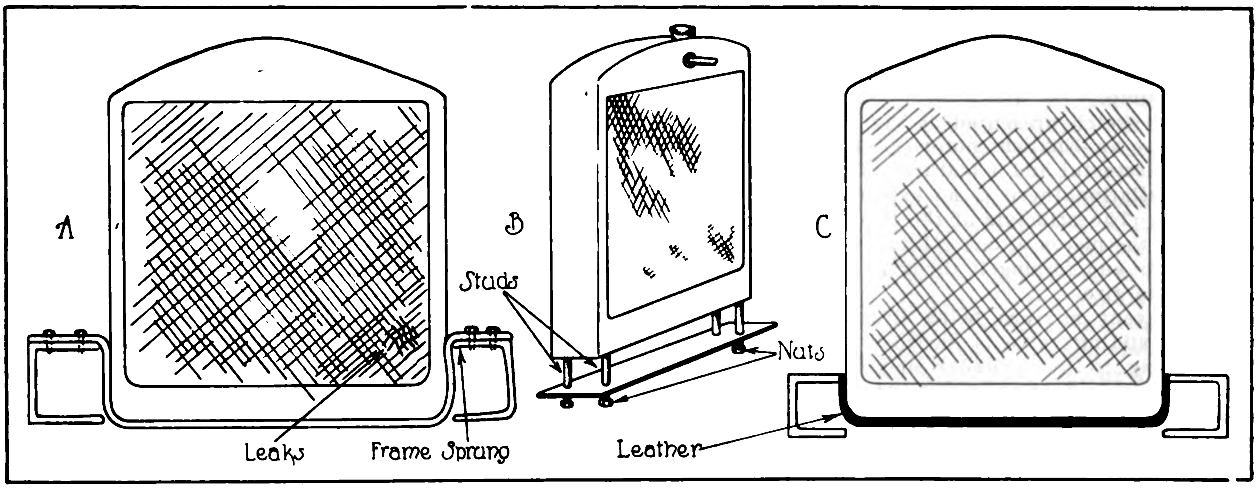


Fig. 8—Causes of Leaks in Radiators: A, Depicting How a Broken Frame Sprung the Tubes; B, Screwing Up Nuts Too Tightly Should Be Avoided; C, Excessive Vibration, Which Started Cooler, Reduced by a Leather Seat.

The radiator began to leak, slightly at first, but soon half of its contents was lost in 24 hours. It was removed, repaired and replaced, and for a time did not leak. The cure was only temporary, however, and a second soldering did not bring about the desired results. When the machine was overhauled it was found that the frame was broken and that when the car was proceeding over the road, the stresses caused a strain to be placed upon one side of the radiator, compressing the tubes as depicted in the sketch. When the frame was repaired, and the leaks stopped, the cooler gave efficient service.

Another cause of leaking is depicted at C. Here the cooler was supported by the cross member of the frame and no arrangement provided for absorbing the vibration produced by the high speed motor with which the car was equipped. The cooler was soldered many times but the trouble returned after a certain period. Finally a cure was effected by placing a strip of leather between the supporting member and the cooler. The writer knows of several cases of leaky radiators which were treated successfully by this simple method.

A good radiator may be spoiled in the overhauling of the machine by screwing up the nuts too tightly when replacing the device on its support. At B is shown an excellent method of securing this member. Bottom stud plates support the member and a single rod to dash or motor holds it rigidly. When the locking members are set up too snugly the studs are likely to be started, thus causing a leak.

When a cooler continues to leak after repeated soldering it is well to examine the frame and supports as well as the locking devices to note whether or not some of these are exerting an undue pressure upon the member. Where radiators are constructed and attached properly, they should give efficient service.

In the event the member becomes damaged and the operator attempts a repair, it is well to have a knowledge of the construction of the device as its efficiency may be reduced through too liberal application of solder, thereby shutting off several tubes. Then again, one or more of the tubes may be completely closed in the centre of the container, and when these are filled with water, the fluid may freeze and burst the tubes because it will be impossible to drain the water from the upper part of the members.

In practise it is customary to use the words "honeycomb" and "cellular" to designate the same type of radiator, both being in contrast to the tubular type. In order to realize the difference between a cellular and tubular construction, it should be borne in mind that the water in a radiator must go from the top to the bottom. It enters the top hot from the water jackets of the motor and leaves the bottom relatively cool in its course to the motor again.

In a tubular member, if vertical tubes be employed, the fluid, in going from the top to the bottom, can go through any one of the numerous tubes. Should one become clogged, all of the water will have to go through the other members. Each is a separate path from the upper water container to the lower.

In the cellular type there are not separate paths from the top to the bottom. The water passages rather constitute a system of spaces or cells similar to the cellular construction of plant life. Generally speaking, cellular radiators are formed in three or four divisions, these being indicated by the horizontal lines across its front. Where lines cross there is an open horizontal water passage through which the fluid can flow from side to side as it chooses. In each division there is a series of zigzag water spaces.

In some types of coolers these spaces really are zigzag tubes, but in others they not only provide an up-and-down direction of flow, but also interconnect to give a horizontal flow as well. There is no clearly defined passage, though the water must flow in a certain direction, as is the case with tubular members.

MOTOR REVOLUTION CHART.

Motorists mechanically inclined who desire to ascertain the number of motor revolutions a minute at different speeds will be aided by the chart presented at Fig. 9. The usual method involves considerable calculation or the use of the slide rule. By following the instructions given herewith, the most unskilled in mathematics may note the speed of the motor when the vehicle is travelling at a rate varying from one mile to 100 an hour.

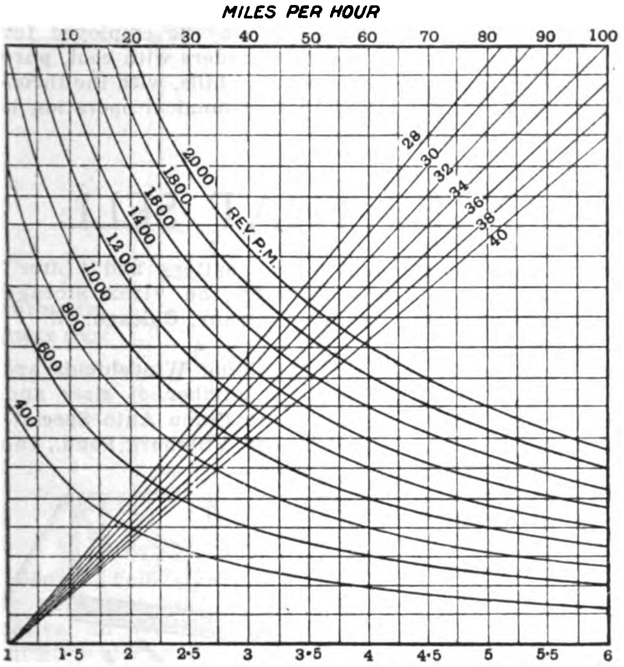


Fig. 9—Chart for Ascertaining Number of Motor Revolutions at Different Road Speeds.

To use: Find the miles an hour on the top line and follow the vertical line down until it cuts that of the wheel diameter. Then move along a horizontal line until a point vertically above the gear ratio on the bottom line is reached. The engine curve which passes through this point, or would pass through it if drawn up, gives the required motor speed.

For example: A car is proceeding at a rate of 30 miles an hour, has 32-inch wheels, and is geared three to one. Proceed along the top line until the figure 30 is reached; drop vertically until the 32-inch wheel line is encountered; then, work horizontally till the vertical line is met from the gear ratio three on the base line. The nearest engine revolution curve will show that the motor speed has reached approximately a rate of 1000 turns a minute.

If any three of the four quantities, gear ratio, speed of car, wheel diameter, and engine speed are known, the fourth can be found by inspection. Engine speed in revolutions a minute is, however, the factor usually required.

GAS COMPRESSOR FOR CLEANING.

Some shops utilize a brush and can of gasoline to clean the dirt from the chassis, but this practise has its disadvantages when certain parts of the mechanism are treated because of their inaccessibility. Many large garages employ an apparatus which uses gasoline and compressed air. These devices may be made by any repairman and are not very expensive.

At Fig. 10 A is depicted a home made compressor which consists of a galvanized tank with a tube soldered into it at the top and another at the lower end. These members are fitted with valves as shown and joined. The hose may be of any suitable length and of the size known as .375 inch, and attached to the latter is a nozzle with a .25-inch flared outlet. A bicycle pump is connected with the tank at one side and a pressure gauge installed at the top of the former.

In service, a gallon of gasoline is poured into the tank and the pump operated to obtain a pressure of several pounds. The valves are then opened to such an extent as to permit a small quantity of the fluid and air to flow, producing a spray or vapor. While the device is not as efficient as those marketed, it is practical and adaptable to a small shop.

CONE CENTRE DIVIDERS.

A handy dividing tool for scribing accurate lines around existing holes or centres is outlined at Fig. 10 C and consists of the clamping sleeve and needle of a regular surface gauge, and a hardened centre box having a 60-degree cone at the lower end. The centre bar may be made of drill rod and of the size of the surface member, so that the sleeve will fit. When the holes to be used as centres are larger, a .3125-inch ball is employed. This has a 60-degree centre made in one side as depicted. The sphere is magnetized, so that it will not fall off when being placed in position. This device will prove useful for all around work.

NEW TYPE OF CARBURETOR VALVE.

A new type of extra air inlet valve which is operated by hand, and designed to fit White & Poppe (British) carburetors, has been brought out by an English concern, and is illustrated at Fig. 10 B. The device is fitted into the elbow of the intake pipe, and although a special form is required, no other alterations are necessary in installing it for use.

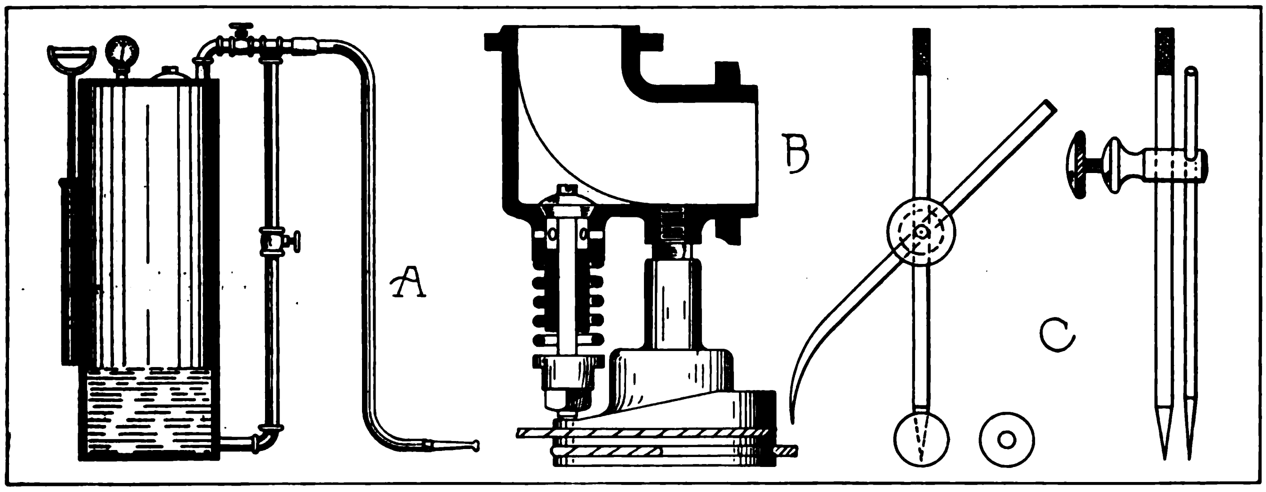


Fig. 10—Appliances Applicable in Motor Car Repairing: A, Inexpensive and Easily Constructed Gasoline Compressor; B, Hand Controlled Extra Air Inlet Carburetor; C, Cone Centre Dividers.

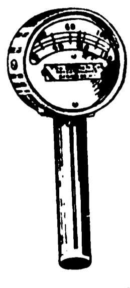
The valve is provided with a stiff spring which retains it on its seat, and is raised by the action of a cam, upon which the bottom of the member rests. This cam is rotated by hand through Bowden wire fitted and wound in the grooves as shown. The construction of the operating mechanism is such that an extremely fine adjustment is possible as nearly an entire revolution of the cam is required to give the valve its utmost lift.

At its highest point the cam continues for a short distance at right angles with the stem of the valve, so that no effort is required to hold the latter open to its limit. The attaching of the device does not necessitate any alteration in the adjustment of the carburetor as the appliance is entirely supplementary and intended principally for service when the motor is warm or operating at high speeds.

Another feature is that it may be employed for scavenging, by providing the cylinders with cool, pure air when the vehicle is descending hills, with the throttle closed. It is claimed that economical operation is possible through its use.

ACCESSORIES AND APPLIANCES THAT SELL.

The Tire Pressure Tester, as shown herewith, and made by the Brown Company, Syracuse, N. Y., is a device for proving tire inflation pressures. It has a circular form about the size of a silver dollar mounted on the upper end of a short stem. When it is desired to prove the tension of air in any tire, the lower end is slipped onto the tire valve stem, and then removed. The maximum will be shown by a red hand which will stay in that position until turned back by hand. This makes it possible to take the pressure, and read it when convenient, instead of bending over in the dust of the road to note it in place. This is small enough in size to be carried in the pocket, and is guaranteed within two per cent. by the maker. The exterior is of brass, highly polished to present a neat appearance.



BROWN TIRE PRESSURE GAUGE

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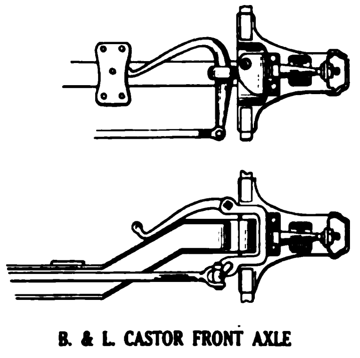
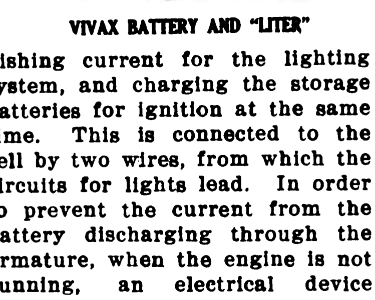
The B. & L. Castor Front Axle is a safety device, primarily, although as an axle, it is as efficient as other designs. The difference lies in moving the pivot pin centre upon which the steering knuckle turns forward of the stub axle centre line, so that the wheel as a whole actually trails back of its pivot point. This, the maker claims, will cause the wheels to run straight ahead whether the steering connections are made or not. This feature should make this work less fatiguing, for the car practically steers itself. Among the many advantages claimed are: Steering, 85 per cent. easier, driver has much better control of the vehicle, impossible to break knuckle or pivot pin, impossibility of breaking a spindle, car can be turned in less space, and many others. The patents are held by the Queen Manufacturing Company, Charles City, Ia., and Chicago, Ill., for whom the Weston-Mott Company, Flint, Mich., is producing the device in quantities.



B. & L. CASTOR FRONT AXLE

★

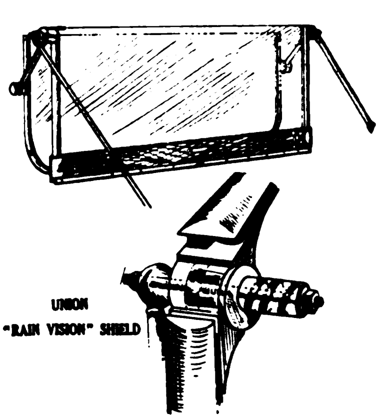
Vivax Storage Batteries are used as an auxiliary to the Vivax "Liter" presented herewith, this being a current generator designed for electric lighting of automobiles. The latter may be driven by belt, gear or chain, furnishing current for the lighting system, and charging the storage batteries for ignition at the same time. This is connected to the cell by two wires, from which the circuits for lights lead. In order to prevent the current from the battery discharging through the armature, when the engine is not running, an electrical device breaks the circuit between that and the battery. When the motor speed reaches a certain figure, this automatically closes, throwing the generator into play as a charging unit. Another automatic device takes care of variable speeds and prevents battery injury. Both battery and "Liter" are made by the Vivax Storage Battery Company, Chicago, Ill.



VIVAX BATTERY AND "LITER"

★

Union Folding Windshields are made in a number of sizes and styles by the Union Auto Specialties Company, Pittsburg, Penn., the so-called rain vision being shown herewith. Three positions are possible; with the upper half of the glass inclined slightly forward, with the same part in front of and parallel to the bottom, in which its lower edge laps over the top edge of the latter slightly, and folded as drawn. The first is an ideal wet weather form in that the inclination of the glass prevents the ingress of rain, snow or much wind, while at the same time, leaves ample space through which to view the road. The second placing of the upper half is excellent for summer touring, in that the air can circulate freely through the shield, while wind, dust, insects or anything liable to bother driver or passengers are barred effectually by the overlap mentioned. Below is shown the automatic lock with which all of these products are equipped, this being a phantom view, in which the internal balls, which do the locking, may be seen.



UNION "RAIN VISION" SHIELD

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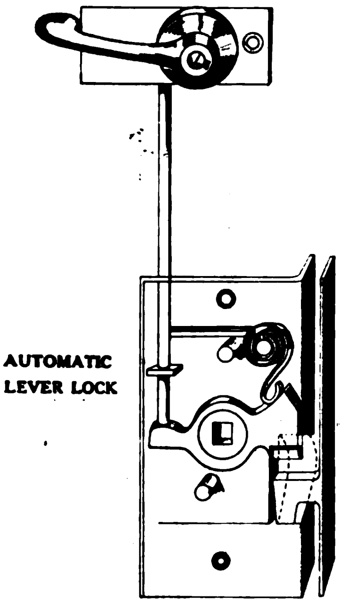
Automatic Security-Latch Lever Locks are for use on car doors, the rapidly increasing number in service necessitating something of this sort. It is not a lock in the same sense as the device which is not opened without a key, for with this latest production of Joseph N. Smith & Co., Detroit, Mich., no key is needed, although

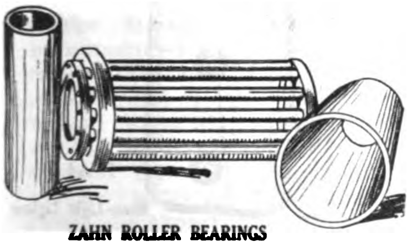


AUTOMATIC LEVER LOCK

the door is held closed until the lever on top is used. As an alternative, an outside handle may be fitted which will also release the catch, but as the maker says, it is eminently fitted to use without this attachment, which detracts from the appearance of a four-door body of clean lines. In construction it is very simple, as the drawing on this page indicates, consisting of a small number of parts, all of cold rolled steel or drop forgings.

*

Zahn Roller Bearings have an interchangeable feature which renders them quite different. These are made by the Detroit Roller Bearing Company, Detroit, Mich., while the Bower Roller Bearing Company of the same city has recently taken out a license from the inventor to construct a slight modification of the design. The form shown on this page is that brought out originally by Oswald F. Zahn. This has two sleeves and one set of self-contained rollers, the latter including the thrust rings. The former are placed in the wheel and on the axle turning within it. The bearings each have a small inner ring and a large outer one which enter grooves in the rollers, these being located at the single end of the former. It has been found that these two, acting as guides without further friction or strain, keep the rollers in alignment at all times, so that they always run exactly true. The collar turned into each one of the rollers, into which the larger ring fits, makes this bearing able to take up all end thrust. The assemblage of rollers and cage is such that one end of the internal part may be twisted through almost half a circle, and when freed will right itself, regardless of the amount and character of end thrust upon it.



ZAHN ROLLER BEARINGS

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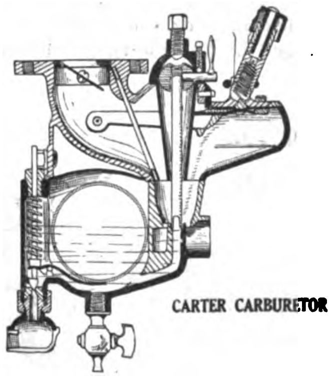
The Carter Carburetor is a recent vaporizing device which has been placed on the market by the Carter Carburetor Company, St. Louis, Mo., a firm having no connection with the maker of the automobile by the same name. It is said the device is the result of 11 years' study and experimentation by William C. Carter, the concern's superintendent. It is a vertical multiple-jet form with float control of the fuel entrance, the latter consisting of a seamless copper ball, a perfect sphere which rests upon the inner end of a needle operating lever. When the ball rises through the increased height of liquid, a spring is allowed to push the controlling needle down and cut off the supply. As the sketch herewith brings out, flow from the float chamber of the vaporizing compartment is through a curved passage, thence up through the interior of the hollow pipe. The latter has a series of small holes drilled in it so as to form a continuously ascending spiral. According to the engine demands, the fuel will climb inside of this, so that the stronger the suction, the greater number of openings which will be spraying. The air inlet is near the base, where it surrounds the gasoline standpipe, rising with it, until the vaporization chamber is reached, where it branches out being augmented by the auxiliary air passage. The latter curves downward from the valve at the top and after passing the fuel pipe, upward to the engine connection at the left. When the motor is slowed down, on the other hand, a nearly pure mixture passes directly through an inclined tube leading from the lower part to the upper side of the throttle. In this way, even with the latter shut off for very slow speeds, the anti-strangling tube, as it is called by the maker, furnishes sufficient fuel to enable the engine barely to just turn over. Model B is made in five sizes, and Model A, which is water jacketed, in four.



CARTER CARBURETOR

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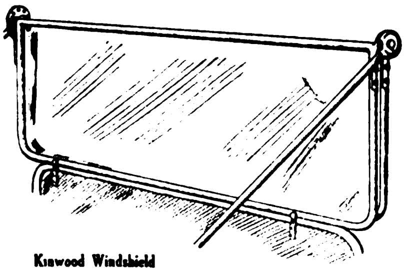
Kinwood Windshields being marketed by the Kinsey Manufacturing Company, Toledo, O., maker of radiators, oilers and motor car appliances, are adaptable to any type of car and in the accompanying illustration is shown the device folded. Its construction is such that it can be placed at any angle and this applies to the lower as well as the upper section. The locking members are automatic in their action and are said to be so arranged that they will not jar loose and at the same time will permit of changing the angle by the operator without leaving the seat.



Kinwood Windshield

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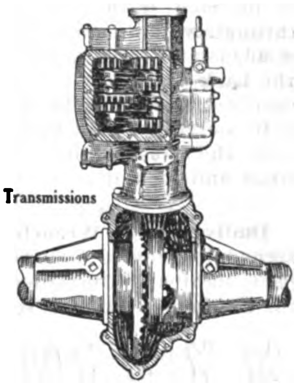
Covert Unit Transmissions, the product of the Covert Motor Vehicle Company, Lockport, N. Y., are designed for hard service and these are made for vehicles ranging from 1000 pounds to three tons capacity. The gearbox is attached to the differential housing as a unit as shown in the accompanying illustration. This design is utilized in pleasure as well as commercial vehicles and has been adopted by several of the leading manufacturers.



Covert Unit Transmissions

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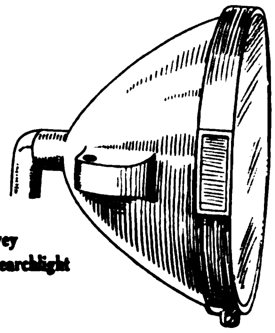
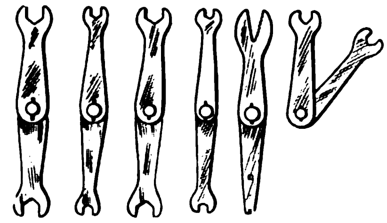
The Silvey Electric Searchlight is of the torpedo type, and its carrying ears are cast integral with the body, so located as to produce equal balance and rigidity. It is parabolic in shape inside and conical outside, is free from beads and other obstructions and therefore is cleaned easily. The materials employed are silver, aluminum and another light metal which is held to possess great strength, and the complete lamp is said to be unusually light. The casting from which it is made is turned in a machine to a perfect parabola, ground and polished until it has the brilliancy of a mirror. It is claimed that it will not tarnish. The door is so constructed that the lamp is practically air tight, eliminating dust and moisture. The lamp holder is adjustable by means of a set screw. In addition to this light the Silvey Electric Company of Dayton, O., manufactures another which may be inserted in the regular gas lamp. This member comes complete having an adjustable socket and flexible cord for connecting to the source of electricity. The device which is fitted to the regular gas lamp is a silver spun reflector, highly polished and is furnished in sizes from five to 11 inches, inclusive. It is attached readily in a few minutes and may be removed easily in the event the use of the acetylene burner is desired. The incandescent lamp is mounted in a marine type socket, being securely locked in place. The latter is inserted in a tube or tunnel through which the wires enter and is adjustable in a curved stem in the back of the lamp. All that is required to set the light for focus is to loosen the locking screw, and slide the tube to the position desired and lock it into place.



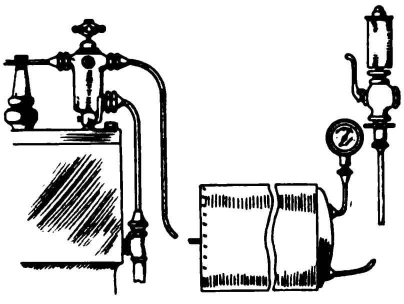
Silvey
Electric Searchlight

Dudly Folding Wrenches are designed to provide a durable, compact, light and convenient wrench for automobile, motorcycle or motor boat work. The maker is the Dudly Tool Company, Menominee, Mich., which has had long experience in the production of tools of all sorts. It will be noted by examination of the accompanying sketch that the device comes in sets, comprising openings for all classes of work. The entire set of six folds up and fits into a case about seven inches long by four high, making a decidedly convenient method of carrying them about.



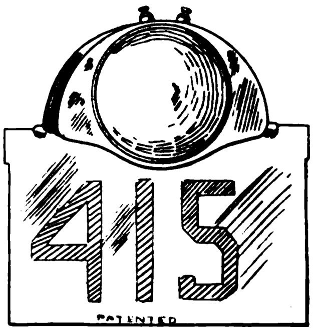
Dudley Folding Wrenches

Lunkenheimer Whistles are being utilized largely on motor boats as the Federal laws require a device of this kind. They also are applicable to an automobile and provide a convenient and positive means of signalling. That depicted in the drawing, however, is the type employed on power boats. Energy is taken from the cylinder and the exhaust and led through piping to a check valve to a tank and stored. The latter is fitted with a gauge which indicates the pressure in the container and when a sufficient amount is secured further supply may be cut off by a valve. A whistle is attached to a tube leading from the tank and is operated by the energy of the gas. The equipment is installed easily and occupies little space. It is the product of the Lunkenheimer Company of Cincinnati, O., maker of specialties adapted to motor cars and marine engines.



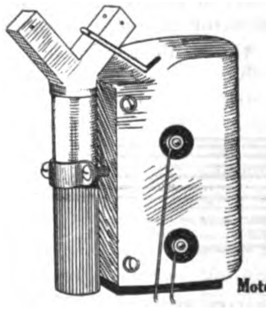
Lunkenheimer Marine Whistle

The Holt & Beebe Electric Tail Light is designed to replace the member utilizing oil, and its construction is such that it meets with all requirements of the authorities, providing as it does a brilliant red light as well as white. It is neat and compact, may be attached easily to the number plate or body of the car, and is operated by electricity, the usual equipment being a six-volt lamp, unless otherwise ordered. It is made of brass, or black or white nickel, and equipped with two screw terminals for attaching the wires from the source of electricity. The arrangement of the device is such that a brilliant white light is shed upon the number plate and the red semaphore to the rear also is illuminated, this glass being of ample dimensions. A switch is placed convenient to the operator and the light may be turned on or off at will without the driver leaving his seat. This arrangement will appeal to motorists who dislike using matches around the car and bothering with kerosene. In addition, it is said no cleaning or attention is required. It is marketed by Holt & Beebe, Boston.



Holt-Beebe Rear Light

The P. & B. Motor-Light Lighter is marketed by the P. & B. Manufacturing Company, Springfield, Mass., and is installed in connection with a gas tank. With it the acetylene lamps may be lighted from the seat of the automobile. It consists of a pressure regulator, flame igniter and controller, spark coil, metal tubing and wire. In the illustration is shown the appliance attached to the burner and it will be noted that two metal points project over the tips of the former. Between these and in proximity to the jets a spark is produced by a low-tension current which ignites the gas. The latter is so controlled that the flame is maintained steadily and at the proper height. The pressure regulator attachment is not shown, but this is fitted easily in line with the usual piping. It is a small device fitted with a union and replaces the regular connection used on the gas tank, the valve of which is opened, thus assuring a supply of acetylene ready for instant use. The device operating the mechanism is placed upon the dash or in a position convenient to the driver and by turning a handle acetylene is conveyed to the burners and lighted. It is claimed that the apparatus may be operated at two ounces uniform gas pressure. It has obvious advantages over the

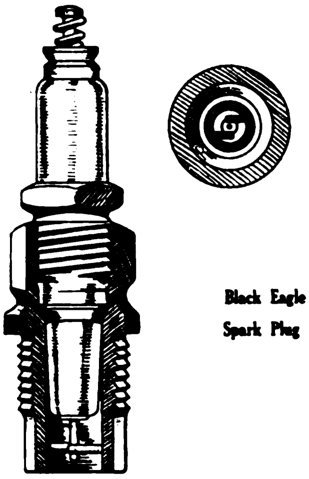


P. and B.
Motor-Light Lighter

ordinary forms which require the operator to stop the machine, turn on the gas, open the lamp doors, ignite the acetylene and relock the lamps. Frequently the pressure is too great and sometimes the mirrors are ruined by the excessive heat generated before flame can be reduced to proper size. The discomforts of alighting when bundled up in heavy clothing and wrapped with robes, as well as in rainy weather, can be avoided. Economy is effected as many times the lamps are left burning because of the labor involved in lighting. With the Motor-Light the lamps may be extinguished at will, and relighted without trouble.

★

Black Eagle Spark Plugs produced by the Progressive Manufacturing Company, Torrington, Conn., present constructional features of merit, one of which is simplicity and ease of disassembling for cleaning or replacement of parts that might be broken through accident. The metal body is recessed and a gasket inserted to prevent the escape of gas past the porcelain. The locking member is of the usual form, being threaded into the body. The electrode is pin shaped and is located between two similar members providing a double sparking gap, as shown in the accompanying sketch. The high-tension wire is held by a spring terminal which permits of easy engagement or release. A cup shaped member is fitted at the lower end of the spring which is held securely at the top of the rod on which it moves.


Black Eagle Spark Plug

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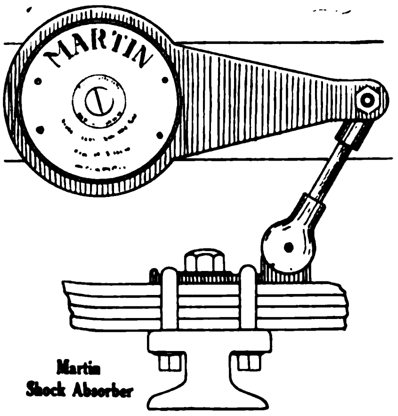
The Martin Shock Absorber, manufactured by the Martin Shock Absorber Company, Los Angeles, Cal., is a device designed to act when the springs recoil. As the latter are compressed the arm of the appliance is forced upward, relieving the friction between the shoes and absorber ring by revolving the T shaped toggle members to the right. The recoil movement draws the arm of the absorber downward, turning the ring to the left. This motion causes the toggle members to straighten until they come in contact with stops provided, thus forcing the brake shoes into frictional engagement with the absorber ring. The necessary degree of friction is obtained by adjusting the hexagon expanding bolt in the centre of the absorber. The coil springs hold the toggles in position ready for instant engagement. The device is packed with hard oil, and it is claimed will not require lubrication but once a year, and is free from rattles or squeaks.



Martin Shock Absorber

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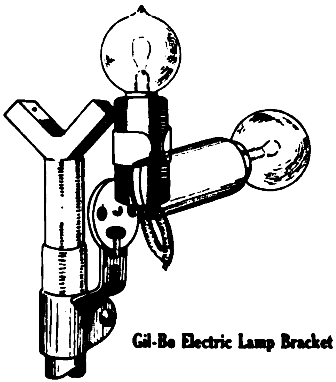
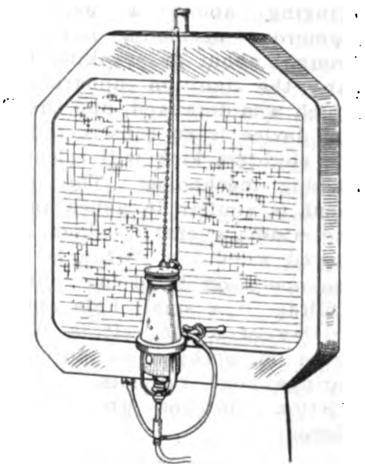
The Gilbo Electric Lamp Bracket is an attachment which permits the use of oil or gas burners without removing either the electric bulb or bracket. This device will appeal to motorists whose automobiles are not equipped with an electric lighting system, which may be desired. The appliance may be fitted easily to the acetylene burner of the headlight, as the operation involves but the locking of a band around the base of the burner. The metal part is hinged, which permits the holder and lamp to be raised or lowered at will, providing a dual lighting system as well as a convenient method of installing an electric lamp. The novelty is made of spring brass, highly polished and nickel plated, and is fitted with notches to hold the bulb either in a vertical or horizontal position. It is inexpensive, equipped with wires for the purpose of attaching the leads from the current container, and is made by the Metal Specialties Manufacturing Company, Chicago.

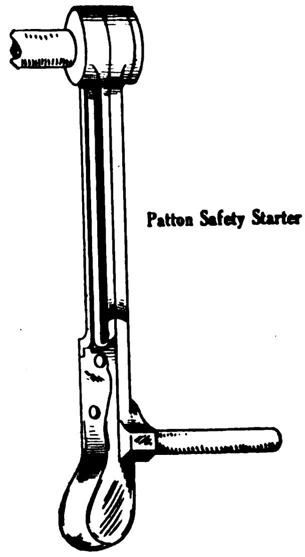

Gil-Be Electric Lamp Bracket

★

The Neverout Radiator Heater is a small, compact device made with the object of keeping the water in the circulation system of an automobile warm when the motor is not in operation and the machine is standing in a cold place. It will appeal to motorists whose garages are not heated and to those who do not favor the use of anti-freezing solutions. The drawing depicts the type intended for garage use, and it will be noted that a tube leading from the appliance, is hooked to the filler hole of the radiator. A bracket is interposed between the cooler and burner to keep the latter from affecting the solder of the former. A pipe leads from the city gas supply to the bottom of the burner and another tube is attached to the petcock under the radiator connecting with the reservoir over the heater. When this is lighted the heated water rises and flows into the cooler. The circulation is on the thermo-syphon principle, the cold liquid falling to the bottom of the radiator, thence to the heater. Another form is permanently attached to the car and acetylene is burned. The generator is a double walled cylinder of about four inches in length with cross staggered tubes connecting the members, around which the gas passes. A burner resembling the Bunsen type is employed and the oxy-acetylene flame is said to have a temperature of about 3000 degrees at the tip of the inner cone. The device utilizes about four times as much air as it does gas and under normal conditions is said to consume about half a cubic foot an hour. The Neverout heater is made by the Rose Manufacturing Company, Philadelphia.

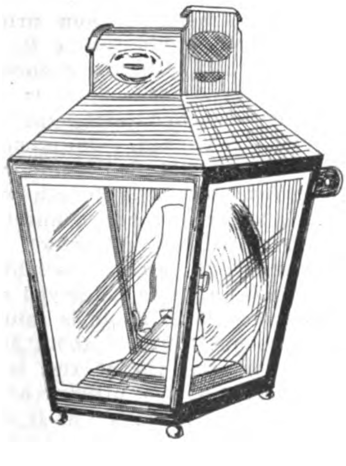

Neverout Radiator Heater

The Patton Safety Starter Crank is being sold by the Patton Crank Company, Chicago, and is designed to eliminate any possible danger in the event of the ignition being advanced and thus bringing about a back fire. Numerous accidents have been brought about by cranking motor cars the ignition apparatus of which was deranged, and the Patton device is so constructed that the slightest kick will release its locking mechanism. The instrument is similar in appearance to the ordinary crank, which is removed when the Patton is fitted, the operation involving but the drilling of a small hole and the driving of a pin. It is claimed there is nothing to adjust, as springs, cogs, ratchets, pawls or friction clutches are not employed.



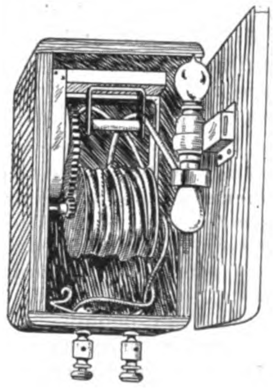
Patton Safety Starter Crank

A New Safety Garage Wall Lamp, which burns kerosene, has been brought out by Benetfink, London, Eng., and it is held the light may be used in a room which is impregnated with gasoline vapor. It is designed for small garages and buildings not equipped with electricity. The appearance and construction are similar to the ordinary wall member, with the exception of the top, which is equipped with a fine wire gauze. The object of this is to prevent the gasoline vapor from reaching the flame, an arrangement resembling a miner's lamp. The lamp is equipped with brackets for attachment to the wall, is about 11 inches square and is said to burn for 15 hours.



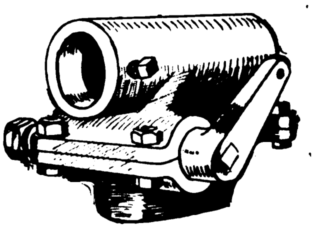
New Safety Garage Wall Lamp

The Christman Dash Lamp is an appliance being manufactured and marketed by the Penn Auto Supply Company, Philadelphia, and the arrangement is unusually neat and compact. It consists of a portable electric light attached to a flexible cord operated by a mechanism which does away with the winding up of the wires after use. The latter pass over a guiding bar and are wound on a drum to which is attached a small gear in mesh with a larger member. This is actuated by a spring that revolves the drum when released, and the cord automatically is rewound. The lamp is fitted to a neat handle and a clip attached to the door of the container keeps the light from rattling or being broken. The mechanism is placed in a compact box, which may be attached to the dash or other parts of the machine, and two screw terminals are provided for connecting the leads from the battery or current generator. The cover is fitted with a lock and key. The container is made of hard wood and nicely finished.



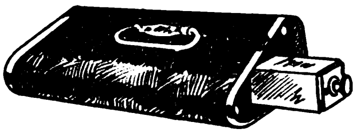
Christman Dash Lamp

The G. P. Muffler Cut-Out, produced by the G. Piel Company, Long Island City, N. Y., is made in two forms, one being fitted with flanges for the purpose of attaching without removing the exhaust pipe. The ends of the other, which is illustrated, are bored to the exact size of the exhaust piping and are provided with shoulders at either end, which prevent it from moving back or forth. A set screw locks the appliance, thus preventing movement. A feature of the cut-out is its construction, being made in two parts and held together by bolts. This permits easy disassembling for cleaning or other purposes. The construction and seating of the valve is such that it completely shuts off the line to the muffler when the cut-out device is open, and is compelled to take the correct angle for deflecting the exhaust gases. It also is claimed that when the valve is closed it cannot be reopened by the pressure of the exhaust. The sections of every part of the device are greater than that of the exhaust line, decreasing back pressure as well as intensifying the volume of sound.



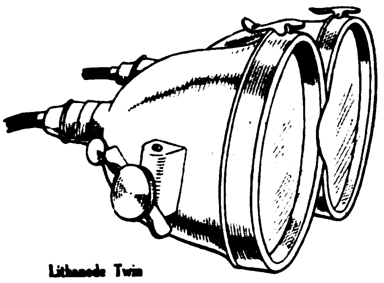
"G. P." Muffler Cut-Out

The Clark Automobile Heater will appeal to motorists who operate their cars during cold weather, as it provides a supply of heat for a considerable time, requiring no attention other than starting it and replacing the fuel. It is made in several forms; is neat, durable and compact, and so simple that it may be operated by a child. The slanting form is popular with motorists, having as it does both side and end ventilators, which may be made to throw out as much or as little heat as desired. It is 14 inches long, weighs nine pounds and is fitted with cold drawn steel ends, heavily nickel plated and covered with a high grade of Brussels carpet. As the heater is made in divers styles and covers, one may be obtained to harmonize with the upholstery of the machine. The fuel is a Clark coal, which ignites easily, and is produced in the form of a compact brick, being 7.5 by 2 by 1.25 inches. One of these briquettes is placed in a drawer in the heater, and when ignited does not flame or smoke and is free from smell during its combustion, which is slow, owing to the composition of the material. A regulating device allows the amount of heat to be adjusted to a nicety, and it is claimed that one charge will provide warmth from 12 to 16 hours. The fuel is inexpensive and comes in cartons of one dozen. The appliance is manufactured by the Chicago Flexible Shaft Company, Chicago.



Clark Automobile Heater

The Lithanode Twin Electric Headlight is produced in England by Longstreth's, Ltd., 190 Queen's Road, Battersea, S. W. It consists practically of two electric side lamps placed together as the accompanying sketch brings out. The arrangement is neatly and strongly made, and each bulb is provided with a separate adjustment for focusing. By means of this, it is possible to cause one-half of the lamp to project a long distance beam, while the other illuminates the side of the road, or both can be used in long distance service or diffusion as desired. The bulbs ordinarily employed are of four candlepower. When necessary the Lithanode fog-piercing amber colored bulbs may be inserted instead.


Lithanode Twin Electric Head Lamps

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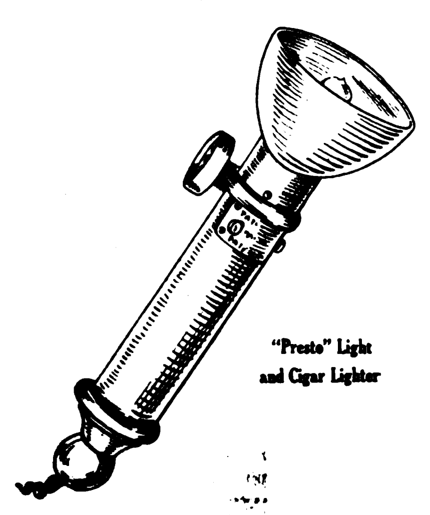
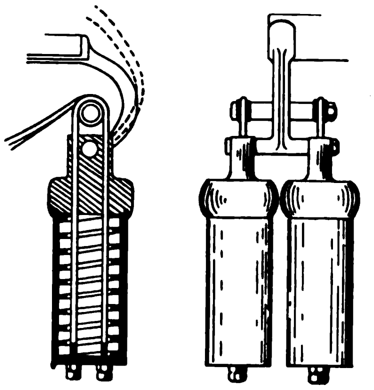
The Presto Lamp and Cigar Lighter is a novelty manufactured and marketed by the Metal Specialties Manufacturing Company, Chicago. It is a combination device as by it light is furnished while making repairs about the machine or for inspection and the acetylene gas of the head lamps may be ignited, as well as a cigar. This last named feature will appeal to motorists and motor boat owners who smoke, as lighting a cigar in the wind is a difficult feat. The lamp is portable, equipped with 10 feet of silken cord and is fitted with two press buttons, one operating the lamp and the other the cigar lighter. The latter is fitted with a platinum tip, and like the lamp may be replaced at a slight expense in the event of damage. The appliance may be attached to dry cells or a storage battery providing a current of six volts although the company manufactures outfits operated by a stronger current.


"Presto" Light and Cigar Lighter

★

The J. M. Shock Absorber which is made in several forms to conform to the design of the car, is marketed by a company whose main office is at Philadelphia. It consists principally of a form of coil spring fitted in a tube and so constructed that all road shocks are absorbed. When attached to machines having topped C shaped springs linked to the bottom members in the usual manner, double tubes are utilized. When single springs are employed of the same type, one cylinder is sufficient. Another model is adaptable to motor cars having single laminated springs, one end of which is attached to a rigid hanger directly connected to the chassis. A third is for the rear end of the front member. The device is attached easily and without modifying the framework of the car.


"J. M." Shock Absorber

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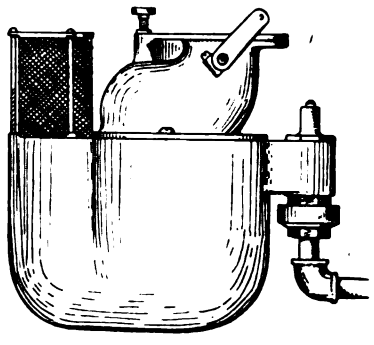
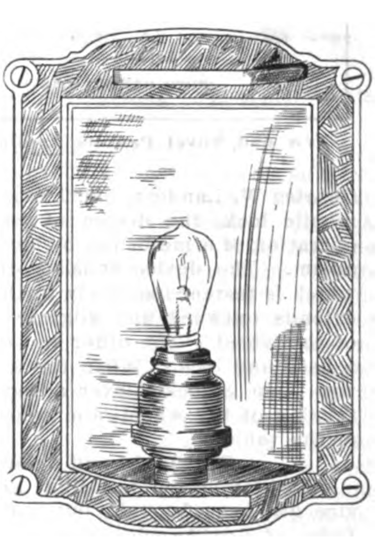
The Air-Friction Carburetor differs from the usual vaporizers as the member taking in atmosphere is fitted with a strainer which does not permit of a vacuum being formed at the spraying nozzle. The maker claims that the use of a vacuum necessitates an obstruction in the passage of the air to the motor and that this arrangement makes it impossible for the engine to secure a satisfactory fuel mixture with a wide open throttle. This is said not to be necessary with the air-friction member which is fitted with a large nozzle providing more gasoline surface to the incoming air and which has a passage around the nozzle varying in size concentrically. Because of this construction it is claimed that fuel economy is obtained as well as very low speeds on the direct drive. Another feature is that cold weather starting troubles are said to be eliminated. It is produced by the Air-Friction Carburetor Company, Dayton, O.


Air-Friction Carburetor

★

Electric Corner Lights are among the electrical novelties adaptable to the automobile and these are manufactured and marketed by C. Cowles & Co., New Haven, Conn. The device is intended for the purpose of illuminating the interior of closed vehicles. It is fitted to the corner of the car and is controlled automatically by the lever which opens and locks the door. When the latter is opened the lamp is lighted and a revolving cover exposes the light. The latter is extinguished when the door is closed and locked. and the cover to the device closes. It is neat and attractive in appearance and the frame is made of polished brass, nickel, silver or gun metal, provided with a silver reflector. It is about five by 3.5 inches. When fitted to the limousine body the lamp lights up the interior, facilitating entrance and egress of the passengers. Many costly gowns have been ruined by mud splashing on the steps. With the corner light these are illuminated, and care may be taken.


Electric Corner Light

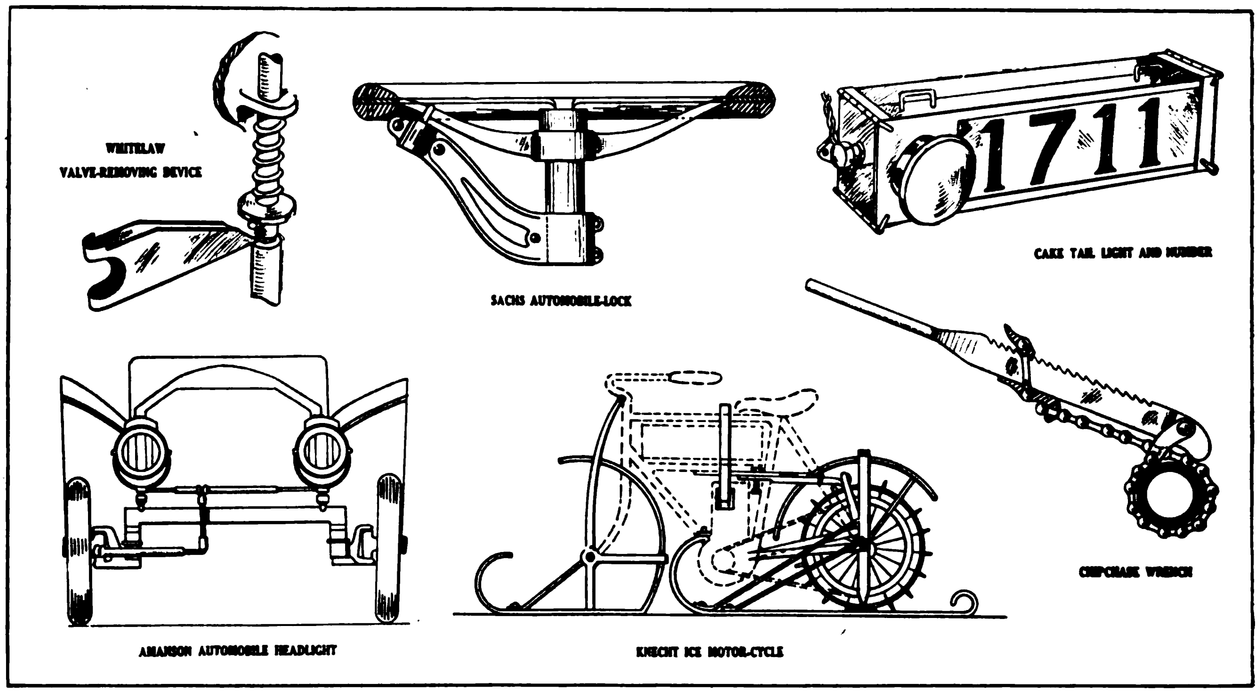
RECENT PATENTS of INTEREST

Valve Removing Device.

A valve lifting tool, which is a departure from the ordinary construction, inasmuch as it is made in one piece and has no moving parts, has been patented by Frederick John Whitelaw, Toronto, Canada. It consists of a bifurcated member adapted to span the valve stem and having beveled upper edges which tend to raise the retaining washer. The bottom part of the instrument is straight and this slides on the valve guide bushing, the movement raising and compressing the valve spring because of the sloping upper edges of the device. The double end of the lifter is open, said aperture being utilized for the purpose of reaching and removing the cotter pin or key retaining the valve spring washer. The remover is made of flat metal and it is claimed that it can be operated successfully on any type of motor.

Steering Wheel Lock.

A patent has been granted to Walter G. Sachs and Charles W. Landers, San Francisco, Cal., for an automobile lock, the design of which is to prevent the operation of a motor car by locking the steering mechanism. The device consists of an arm, one end of which is fastened securely to the steering column, and extends outward and slightly upward to the spokes of the wheel. The other end of the extension carries a hasp and lock. When the automobile is not in use this hasp is locked over a spoke which prevents the turning of the wheel and consequently the operation of the vehicle.


WHITELAW VALVE-REMOVING DEVICE
SACHS AUTOMOBILE-LOCK
1711
CAKE TAIL LIGHT AND NUMBER
CHIPCHASE WRENCH
AMANSON AUTOMOBILE HEADLIGHT
KNIGHT ICE MOTOR-CYCLE

New and Novel Patents Applicable to the Motor Car Including Movable Headlights, Wheel Locking Device, Valve Lifter, Tail Light Combination and Pipe Wrench.

Tail Light and Number Display.

A combination tail light and number display device has been brought out and patented by David S. Cake of Los Angeles, Cal., and a feature of the invention is its compactness. It is square in shape and of sufficient length to incorporate the four or more characters as well as the red semaphore. The latter is of the bull's eye type and lighted by electricity which is also employed to illuminate the numbers. The device is suspended from the automobile by means of straps, these being attached to staples. The construction of the light is such that the numbers may be changed easily and the plate bearing these is held by a spring attachment, which prevents rattling.

Movable Headlight Mechanism.

One of the disadvantages of fixed headlights on the motor car is that in rounding corners the light does not cover the road properly; that is, the car has to be turned before the highway in front of it can be illuminated. A swivelling device has been patented by Lyman O. Amanson and Milton H. Ulrich, Miller, S. D. Its construction is simple and is said to be free from rattles and is adjustable. It is operated by the steering knuckle, to which a tube is attached and leads to a vertical rod, both being pivotally mounted. The latter is connected to another member joining the two lamps and when the front wheels are turned either to the right or left, the motion imparted by the steering knuckle is communicated through the tube and rod to lights, casting beams in proper direction.

Chain Pipe Wrench.

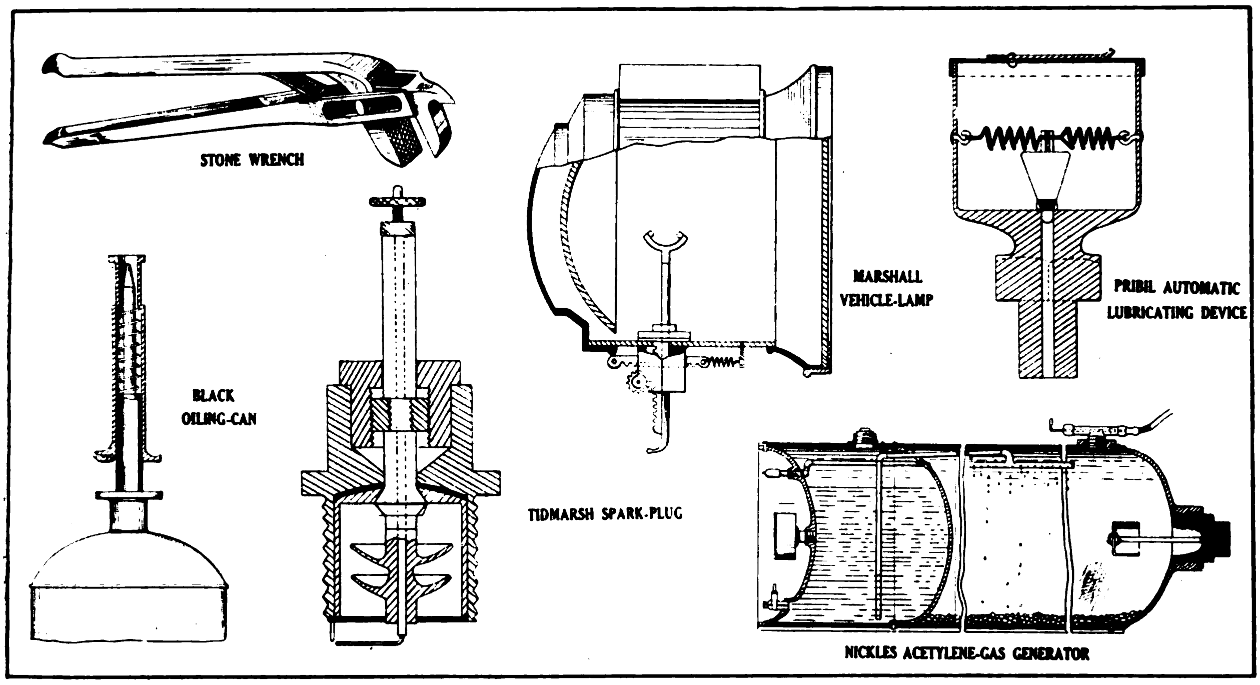
An adjustable pipe wrench has been patented by John Chipchase and Alfred Ernest Metcalfe, Newcastle-upon-Tyne, England. It comprises a lever or arm having a round curved nose at one end and rack teeth on the back for the purpose of engaging a movable pawl, and a chain. One end of the latter is secured to a movable link which is attached to the head of the arm, while the other is free. The yoke carrying the pawl slides freely on the lever and is fitted with a swiveled hook designed to engage with the chain. When utilized on piping the flexible block chain is coiled around the part, the free end passed through and between the arms of the movable link, and attached to the hook of the yoke member. The latter is then slid backward until the chain grips the pipe firmly. When pressure is applied to the handle of the lever the round nosed end compresses a link against the pipe. Being adjustable the size of the member to be gripped is limited only by the length of the chain.

Ice Motorcycle.

Frank Knecht of Lancaster, O., has been granted a patent for an ice motorcycle which comprises the ordinary road mount minus the front wheel, fitted to runners, these being attached to the frame. The front member is movable permitting steering of the device when in operation. The rear or driving wheel is equipped with spikes for the purpose of providing traction and the arrangement is such that it is controlled by means of a lever situated convenient to the driver. A rack bar is attached to the frame and adapted to engage the forward end of the lever which is movable. The rear wheel is supported by a frame and driven by a belt in the usual manner. By means of the lever mechanism the driving wheel may be raised or lowered, this arrangement permitting the spikes to sink more or less into the ice, according to the condition of the surface to be traversed by the machine.

Acetylene Gas Generator.

An acetylene gas generator cylindrical in form and similar in shape to the regular gas tank, has been patented by Clair Arthur Nickles, Ponca, Okla., assignor to Clair A. Nickles and Ira Edgar Horack of the same city. Acetylene is produced by the dripping of water upon the calcium carbide, but instead of one or two feeds, several are employed. The container is divided into two compartments, one being utilized for water and the other for the carbide. A tube leads from the former into the gas section and is attached to a horizontal pipe provided with a number of openings. Another tubing and a pop valve are located in the recessed portion of the tank and are in communication with the carbide chamber. The object of the valve is to maintain a maximum working pressure in the water chamber, as well as to start the device. A pressure gauge also is fitted and piped to the water chamber. A service opening is attached to the top of the tank and includes a shut-off valve. Carbide is introduced through an opening closed by a screw plug and a similar device is utilized on top of the water compartment. The pressure of gas is maintained by the communication between the chambers, the gas passing alternately to each, when the normal pressure in either drops below that in the other. A second pop valve is in line with the tubing leading from the gas chamber, and the device is set to blow off at about the maximum working pressure of the generator. The first is adjusted to resist a pressure greater than that of the other member.



Some Recent Patents Applicable to the Motor Car, Including Wrench, Adjustable Headlight, Acetylene Gas Generator, Oiling Can Protector and Automatic Lubricator.

Marshall Vehicle Lamp.

A patent has been granted to William C. Marshall of New Haven, Conn., for an automobile headlight which is provided with means for adjustment as well as changing the focus. The lamp consists of the usual members, the mirror and casing being composed of glass and metal. The burner holding device, instead of being set and fastened as usually is the case, is so arranged that it may be moved backward or forward, and up or down. The tube to which the burner is attached is fitted with flat extensions and these, when in a normal position, are flush with the bottom of the casing. The part that extends through the latter is fitted with a rack. Attached to the base of the burner member is a pinion so arranged that it meshes with the rack that moves the burner longitudinally. This allows the light to be moved vertically or horizontally and it is claimed that a fine focus may be obtained, as well as movement of the light to prevent undue glare. A spring is attached to the rack and casing for the purpose of returning the former to its normal position.

Automatic Lubricator.

The problem of properly lubricating parts subjected to friction has been solved by many ingenious methods, some of which are of the automatic type. A new design of the latter has been invented by Adolphe Pribil of Paris, France. The device resembles in outward appearance the round grease cup and is constructed along the same lines. From the interior of the vessel extends a duct which leads to the part to be lubricated and into this opening fits a wedge-shaped member which is shaped at both sides in the form of rollers, and has one or more weights connected. This mechanism is attached to a spring which is fastened to the sides of the container. The tension is such that any motion imparted tends to rock the closing member, allowing the lubricant to pass into and out of the duct. The device has a lid for the purpose of replenishing the supply and among the claims advanced is that it is adapted to parts requiring lubricant while in motion.

Tidmarsh Spark Plug.

A novel form of spark plug has been patented by

William H. Tidmarsh, Elgin, Ill., and its construction varies from those of the ordinary form, inasmuch as the insulated member carrying the electrode is of peculiar design, having as it does, extensions or shields in the hollow portion of the metal body. The latter is recessed to take the insulating conical section of the stem which extends upward and through the locking member, and attached to the end is the usual terminal. Gaskets are interposed to render the plug compression tight and the arrangement of the parts compressing these is such that the conical section is drawn snugly into the recessed portion through the movement of the locking member which acts upon a part attached to the insulating stem, and both of these are threaded.

Stone's Adjustable Wrench.

A patent has been granted to Charles E. Stone of Boston, assignor to E. H. Corson of the same city, for a combination wrench which presents interesting features. The handle portion includes a jaw extending at right angles and is recessed for another similar member which moves by means of a pin integral therewith working in slots. This pin acts as a fulcrum and a series of notches is provided for its engagement. A spring is interposed between the handles and is attached to the upper member.

Guard for Oiling Can.

Owing to the light construction of the spouts on some oiling cans these hollow members are damaged easily and when carried in the tool compartment of the motor car are often bent by coming in contact with other metals. The opening is also more or less liable to become stopped up by foreign elements. Charles E. Black of Cincinnati, O., has taken out letters patent for a device which should overcome these troubles. A protecting guard is placed over the spout and when in its natural position prevents injury to the member. A spring is fitted and one end is attached to a shoulder on the spout and the other fits a recess in the tube. The latter carries a pin which moves freely in another recess in the spout. To utilize the container the guard is depressed which movement brings the end of the spout above it.

INFORMATION FOR THE REPAIRMAN.

GAUGES FOR WIRE AND SHEET METAL.

Number of gauge....	Thickness in Decimals of an Inch. Birmingham or Stubb's iron wire..........	Brown & Sharpe......	British Imperial or New British	United States........	Stubb's steel wire......	Diameter of American Steel & Wire Co.'s gauge
0000	.454	.46000	.400	.40625	...	.3938
000	.425	.40964	.372	.37500	...	.3625
00	.380	.36480	.348	.34375	...	.3310
0	.340	.32486	.324	.31250	...	.3065
1	.300	.28930	.300	.28125	.227	.2830
2	.284	.25763	.276	.26562	.219	.2625
3	.259	.22942	.252	.25000	.212	.2437
4	.238	.20431	.232	.23437	.207	.2253
5	220	.18194	.212	.21875	.204	.2070
6	.203	.16202	.192	.20312	.201	.1920
7	.180	.14428	.176	.18750	.199	.1770
8	.165	.12849	.160	.17187	.197	.1620
9	.148	.11443	.144	.15625	.194	.1483
10	.134	.10189	.128	.14062	.191	.1350
11	.120	.09074	.116	.12500	.188	.1205
12	.109	.08081	.104	.10937	.185	.1055
13	.095	.07196	.092	.09375	.182	.0915
14	.083	.06408	.080	.07812	.180	.0800
15	.072	.05707	.072	.07031	.178	.0720
16	.065	.05082	.064	.06250	.175	.0625
17	.058	.04526	.056	.05625	.172	.0540
18	.049	.04030	.048	.05000	.168	.0475
19	.042	.03589	.040	.04375	.164	.0410
20	.035	.03196	.036	.03750	.161	.0348
21	.032	.02846	.032	.03437	.157	.03175
22	.028	.02535	.028	.03125	.155	.0286
23	.025	.02257	.024	.02812	.153	.0258
24	.022	.02010	.022	.02500	.151	.0230
25	.020	.01790	.020	.02187	.148	.0204
26	.018	.01594	.018	.01875	.146	.0181

In measuring either wire or sheet metal a number of gauges are used and it is important to know in what each differs from the other. In this country the B. & S. and U. S. gauges are generally employed, and even in these there is considerable variance, so that in ordering sheet metal or wire it is important to specify the gauge employed in measuring. The table above will serve to make comparisons between the various standards, and the mechanic may determine by micrometer measurement the size and gauge of the wire or sheet metal at hand.

DIMENSIONS AND STRENGTH OF ROLLER CHAIN.

Pitch of chain in inches	Diameter of roller in inches	Width of chain in inches	Breaking stress in pounds
1.00	.5625	.375 and .500	5000
1.25	.6250	.500 and .625	6500
1.50	.7500	.625 and .750	9000

DIMENSIONS OF SPROCKETS FOR ROLLER CHAIN

Number of teeth in sprocket	1" pitch Pitch diameter	1.25" pitch Pitch diameter	1.5" pitch Pitch diameter
7	2.31	2.88	3.46
8	2.61	3.27	3.92
9	2.92	3.65	4.38
10	3.24	4.04	4.85
11	3.54	4.44	5.33
12	3.86	4.83	5.79
13	4.18	5.22	6.27
14	4.50	5.62	6.75
15	4.81	6.01	7.22
16	5.12	6.41	7.69
18	5.76	7.21	8.64
20	6.39	7.99	9.59
22	7.03	8.79	10.55
24	7.66	9.58	11.49
26	8.31	10.38	12.44
28	8.95	11.19	13.42

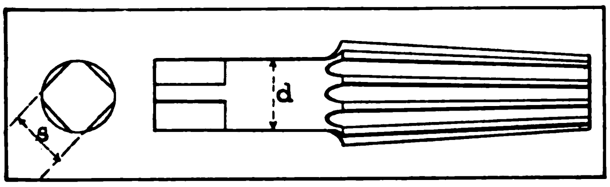
Chain driven motor cars in daily use are sufficiently numerous to make the tables above of distinct value to the motor car mechanic, one of these considering the dimensions of the sprockets, having different numbers of teeth for roller chains of the pitch most commonly used in motor car driving. The outside diameter of a sprocket can be found by adding the diameter of roller to the pitch diameter, while the bottom diameter can be determined by subtracting the diameter of the roller from the figure given for the pitch diameter. The table showing breaking stress is also practical, the figure given being for a constant strain as indicated, or any intermittent stress up to the figures presented for the different sizes. A chain should be used which has an ample factor of safety, as it will soon fail if worked up to the limit of endurance.

Drip Feed Generators—There are still a good many acetylene generators on the market worked by an adjustable water drip, and under the influence of vibration the threaded rod adjusting the quantity of the water is rather apt to work down and reduce the supply. This tendency is easily prevented by slipping a small spring between the rod and the top of the generator. This simple expedient has converted many very exasperating generators into perfectly satisfactory affairs as the drip-feed rod then remains where it may be set.

SIZE OF REAMER AND TAP SHANKS.

In the use of hand tools by the machinist, he has considerable work with both taps and reamers. These come in a variety of sizes and shapes, to keep track of which is almost impossible. With an idea of helping in this confusion the accompanying table of straight shank sizes has been prepared. This gives the diameter of the round, straight portion, and width across the flat of the squared end, both of which must be known in the selection of a wrench to handle them.

Diam. of shank d	Square s	Diam. of shank d	Square s	Diam. of shank d	Square s	Diam. of shank d	Square s
.0625	.0468	.6875	.5156	1.3125	9.844	2.3750	1.7812
.0781	.0625	7031	.5312	1.3906	1.0000	2.4062	1.8125
.0937	.0781	.7187	.5469	1.3437	1.0156	2.4375	1.8281
.1093	.0781	.7344	.5469	1.3594	1.0156	2.4687	1.8594
.1250	.0937	.7500	.5625	1.3750	1.0312	2.5000	1.8750
.1406	.1093	.7656	.5781	1.3906	1.0468	2.5312	1.9062
.1562	.1250	.7812	.5937	1.4062	1.0625	2.5625	1.9218
.1718	.1250	.7968	.5937	1.4218	1.0625	2.5937	1.9531
.1875	.1406	.8125	.6094	1.4375	1.0781	2.6250	1.9687
.2031	.1562	.8281	.6250	1.4531	1.0937	2.6562	2.0000
.2187	.1718	.8437	.6406	1.4687	1.1093	2.6875	2.0156
.2344	.1718	.8594	.6406	1.4844	1.1093	2.7187	2.0468
.2500	.1875	.8750	.6562	1.5000	1.1250	2.7500	2.0625
.2656	.2031	.8906	.6718	1.5312	1.1562	2.7812	2.0937
.2812	.2187	.9062	.6875	1.5625	1.1718	2.8125	2.1093
.2968	.2187	.9218	.6875	1.5937	1.2031	2.8437	2.1406
.3125	.2344	.9375	.7031	1.6250	1.2187	2.8750	2.1562
.3281	.2500	.9531	.7187	1.6562	1.2500	2.9062	2.1875
.3437	.2656	.9687	.7343	1.6875	1.2656	2.9375	2.2031
.3594	.2656	.9843	.7343	1.7187	1.2968	2.9687	2.2344
.3750	.2812	1.0000	.7500	1.7500	1.3125	3.0000	2.2500
.3906	.2968	1.0156	.7656	1.7812	1.3437	3.0312	2.2812
.4062	3125	1.0312	.7812	1.8125	1.3594	3.0625	2.2968
.4218	.3125	1.0468	.7812	1.8437	1.3906	3.0937	2.3281
.4375	.3281	1.0625	.7968	1.8750	1.4062	3.1250	2.3437
.4531	.3437	1.0781	.8125	1.9062	1.4375	3.1562	2.3750
.4687	.3594	1.0937	.8281	1.9375	1.4531	3.1875	2.3906
.4844	.3594	1.1094	.8281	1.9687	1.4844	3.2187	2.4218
.5000	.3750	1.1250	.8437	2.0000	1.5000	3.2500	2.4375
.5156	.3906	1.1406	.8594	2.0312	1.5312	3.3125	2.4844
.5312	.4062	1.1562	.8750	2.0625	1.5469	3.3750	2.5312
.5468	.4062	1.1718	.8750	2.0937	1.5781	3.4375	2.5781
.5625	.4218	1.1875	.8906	2.1250	1.5937	3.5000	2.6250
.5781	.4375	1.2031	.9062	2.1562	1.6250	3.5625	2.6718
.5937	.4531	1.2187	.9218	2.1875	1.6406	3.6250	2.7187
.6094	.4531	1.2344	.9218	2.2187	1.6718	3.6875	2.7656
.6250	.4687	1.2500	.9375	2.2500	1.6875	3.7500	2.8125
.6406	.4844	1.2656	.9531	2.2812	1.7187	3.8125	2.8594
.6562	.5000	1.2812	.9687	2.3125	1.7344	3.8750	2.9062
.6718	.5000	1.2969	.9687	2.3437	1.7656	4.0000	3.0000



Squares on Shanks of Reamers and Taps.

The square size in particular is very useful to know and remember. In later issues, other tap, reamer and drill sizes will be given, the whole making a set of invaluable note book sheets for the ambitious garage or machine shop worker.

Formation of Acetylene Gas—It is not generally known that in the formation of calcium carbide, from which is produced acetylene as it is called, lime and carbon are united under great heat. The first element furnishes the calcium, from which the carbide is made by chemical union with the carbon. One portion of the former to three of the latter produce an element of carbide and another of carbonic oxide, which passes off in the process as a useless gas. When the residue has been crushed to a powder for the commercial form, it is combined with water, as in the ordinary generator. The addition of oxygen in this, of which there are two parts to one of carbide, forms a resultant gas, which is lost, water which is left over, and the desired acetylene, which is produced by the combination of the carbon and hydrogen.

MECHANICALLY OPERATED VALVES.

In designing an engine, or rebuilding, it is often desirable to know the best size valve to use to obtain a certain number of revolutions per minute. In the table below the proper sizes for cylinders from three to six inches bore are given. The dimension specified is the diameter of the valve opening or port and not of the valve head, which will obviously be about one-fourth inch larger than the opening, to allow of sufficient metal for seating. Under the columns denoting piston speed per minute will be found the number of revolutions an engine of certain piston travel must make in the same length of time to produce the piston velocity indicated. For automatic inlet valves, the diameter should be increased by 20 per cent.

		Piston speed in feet per minute					
		600		750		900	
Bore of cylinder..	Stroke	Revolutions per minute	Diameter of valve opening	Revolutions per minute	Diameter of valve opening	Revolutions per minute	Diameter of valve opening ....
3	3	1200	0.72	1500	0.90	1800	1.08
3.5	3.5	1030	0.84	1285	1.05	1570	1.26
4	4	900	0.96	1125	1.20	1350	1.44
4.5	4.5	800	1.08	1000	1.35	1200	1.62
5	5	720	1.20	900	1.50	1080	1.80
5.5	5.5	655	1.32	820	1.65	965	1.95
6	6	600	1.44	750	1.80	900	2.16

Temperatures for Hardening—The following table gives the required temperature in Fahrenheit degrees to produce certain colors, when tempering hardened steel:

Lathe, shaper and planer tools:
    430. Very light straw.
    450. Light straw.
Taps, dies and wood turning tools:
    470. Dark straw.
    490. Very dark straw.
Hatchets, chisels, etc.:
    500. Brownish yellow.
    520. Yellow, tinged with purple.
    530. Light purple.
Springs:
    550. Dark purple.
    570. Dark blue.

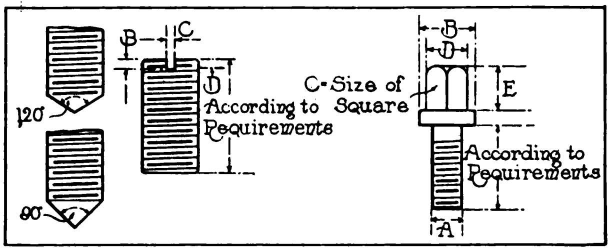
Molten Metals Produce Desired Heat—The following table gives the proportional parts of lead to one pound of tin, which, when melted, will have the required temperature to produce certain colors on hardened steel, by simple immersion:

Color.	Temperature F. Degrees.	Proportions.
Very light straw..............	430	1¾ to 1
Light straw	450	2⅛ to 1
Dark straw	470	2½ to 1
Very dark straw...............	490	3½ to 1
Brownish yellow...............	500	4¾ to 1
Light purple	530	7½ to 1
Dark purple	550	12 to 1
Dark blue	570	25 to 1

Hardening Steel Tools—One of the best, if not the best compositions for hardening steel tools for cutting iron or wood, or even steel, is the following: To one gallon of common fish or whale oil add one pound each of beeswax and resin. When this has been thoroughly mixed by boiling and stirring, heat the steel until the scale rises a little; then immerse in the boiling oil. When cool, heat over a clean fire until cherry red in the dark. Care should be taken as to the amount of resin in the oil, since resin hardens steel, whereas beeswax and tallow toughen it. If it is preferred to temper in daylight, clean the steel, polish it, and draw to a deep straw color.

SIZES OF SET AND COLLAR HEAD SCREWS.

The use of headless screws for holding collars, gears and similar parts upon rotating or stationary shafts is rapidly increasing, while in jig and fixture work, many collar head screws must be utilized. The former are pretty generally understood, which is not the case with the latter, but the dimensions of neither one are common property. Consequently, this issue will concern itself with the proportions of both for addition to our fast growing mechanic's handbook, the sheets for which are published in various issues. In both, the length varies with the requirements, following the general sizes brought out for square and filister headed screws some time ago. In measuring these, the set type includes the overall dimensions, while in the other form, only the distance under the collar is taken.



From these two tables and the small figure which accompanies them, anyone should be able to figure out the size wanted, either when purchasing or when it is necessary to make a few screws, but which it is desirable to have of a standard size for reasons of interchangeability.

Table 1—Headless Set Screw Proportions.

A......	.125	.187	.250	.312	.375	.437	.500	.562	.625	.687	.750
B......	.020	.031	.046	.062	.078	.078	.109	.109	.125	.125	.141
C......	.020	.025	.039	.039	.058	.071	.086	.099	.112	.112	.133
D......	.015	.031	.031	.031	.031	.031	.031	031	.047	.047	.047
Threads an inch	40	32	20	18	16	14	13	12	11	11	10

Glass Polishing Powder—A preparation in powder form which may be used to clean up or polish the surface of fine glass such as costly mirrors, etc., may be made by rubbing calcined magnesia down with pure benzine. This must be continued until the mass formed is sufficiently soft to allow drops of liquid to be pressed out of it. Since the benzine is so very volatile, the mixture must be kept in closely stoppered bottles, preferably those employing ground glass. To use, a little is placed on a wad of cotton or soft rag and the glass rubbed with it.

New Battery Components—A type of Leclanche battery has been produced in France, in which the sal ammoniac electrolyte previously utilized is replaced by chloride of manganese. The claims for the new form are: Holds up much better, has no consumption or open circuit, and can be short circuited without harm. The internal resistance is low and the effective yield is very large. In addition, the liquid does not freeze, while an exhausted form may be regenerated by charging from the outside, hitherto a perquisite enjoyed by the so-called storage cells only.

CHOKED SILENCERS.

In their efforts to obtain a quiet exhaust, many manufacturers employ a form of muffler which necessitates the passage of the exhaust gases through a number of small holes. It has been pointed out before in various articles that a considerable loss of power may be experienced owing to these small holes becoming clogged by the burnt oil and other residues from the engine. The remedy for this loss of power is, of course, to take the silencer to pieces and clean the holes, but, although the directions to obtain the desired end are very concise and occupy very few words, the time occupied in taking a silencer to pieces, cleaning and refitting it, often amounts to hours; this is in consequence of the threads of the various screws and bolts holding the portions together having become burnt or rusted. Having experienced the necessity to clean these holes in the baffle plates of my silencer two or three times in the course of six months, I determined to enlarge them permanently by reaming them out, so that the necessity for cleaning the holes would not arise so often. I fully expected that the exhaust would be considerably more noisy, but at any rate, so far as the occupants of the car are concerned, no difference has been noticed, although a distinct improvement in the engine power has been apparent. It would appear that the mufflers of some engines waste too much power to obtain a silent exhaust.—F. S., in Autocar.

Working Aluminum—The average machinist does not have the same opportunity to machine aluminum as steel, wrought and cast iron or brass and may be in doubt as to the best methods of doing the work. The metal should be worked dry in most cases, except in tapping or when a fine finish is needed when turning. In this case a very light chip is taken and the metal is lubricated with turpentine from time to time. Aluminum, in common with other cast metals is lifeless; that is, long curling shavings cannot be taken off it as with steel, but the metal is removed in a shower of small chips as in cutting cast brass. The metal is easily torn, especially in turning and in cutting threads in a lathe, where the tool may dig in unless handled with care and rip out rough threads. For a nice surface finish, either in lathe or planer use a broad tool with a light cut. Aluminum can be cut as fast as brass if a light chip is taken.

Fine Tungsten Wire—A very fine wire may now be produced from tungsten by the use of the electric furnace. The new method permits of drawing a much finer and more rugged wire than the sintered filament. Previously, tungsten particles have been welded into a continuous filament by passing an electric current through a binding material containing the metal in very fine form. After that, the binder was driven off by extremely high temperatures.

Where oil will not act as a cooling agent on a drill working in hard metals, turpentine used instead will permit the drill to take hold and retain its temper.

To anneal steel for filing and drilling, heat to a low red and bury in slack lime, ashes or forge dust and let it cool gradually.

Table 2—Sizes of Collar Head Screws.

A..........	.187	.250			3.13			.375			.437			.500			.562			.625	
B..........	.375	.500	.563	.563	.563	.625	.563	.687	.750	.687	.750	.875	.812	.875	1.000	.937	1.000	1.062	1.000	1.062	1.250
C..........	.187	.250	.313	.250	.313	.375	.313	.375	.437	.375	.437	.500	.437	.500	.562	.500	.562	.625	.562	.625	.750
D..........	.260	.350	.440	.350	.440	.530	.440	.530	.620	.530	.620	.710	.620	.710	.790	.880	.790	.880	1.060	.880	1.060
E..........	.250	.313	.375	.313	.375	.437	.375	.437	.500	.437	.500	.562	.500	.562	.625	.562	.625	.687	.625	.687	.812
F..........	.094	.125	.125	.125	.125	.156	.125	.156	.156	.156	.156	.187	.156	.187	.187	.187	.187	.219	.187	.219	.250
G..........	.031	.047	.047	.047	.047	.047	.047	.047	.063	.063	.063	.094	.063	.094	.094	.094	.094	.094	.094	.094	.094
Threads an inch......	32	20			18			16			14			13			12			11	

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to deal in motor cars, accessories, etc.:

The H. & C. Garage, New York City; capital, $10,000; incorporators, Louis S. Hallowell, 104 W. 61st street; Herbert S. Cole, Arthur J. Cole.

Sloane Aeroplane Company, New York City; capital, $30,000; incorporators, John E. Sloane, Addison A. Van Tine, 55 Liberty street; Harold Van Tine.

Royal Automobile Machine Company, Brooklyn, N. Y.; capital, $10,000; incorporators, Sydney Solomon, Celia Rothstein, Louis B. Bridsky, William M. Abel.

F A. L. Auto Company, Chicago; capital, $2500; incorporators, Frederick C. Harbour, Clinton S. Lamb, E. M. Lundberg.

Hart Motor Car Company, Chicago; capital, $10,000; incorporators, Frederick P. Hart, Karl Bylngton, Charles G. Stohrer.

Orrin Ray, Inc., Boston; capital, $50,000; incorporators, Harry O. Ray, Alfred R. Greendelle, Willis N. Tuller.

Kincaid Oil Company, Providence, R. I.; capital, $25,000; incorporators, William T. Kincaid, William C. Rodger, Frederick P. Scott.

E. S. Hutchin Auto Company of Kansas City, Kansas City, Mo.; capital, $10,000; incorporators, E. S. Hutchin, William Harmon.

The Boulevard Company, Waterbury, Conn.; capital $5000; president, William E. Russell; vice president, Lizzie E. Russell; treasurer, Albert Delay; secretary, Charlotte M. Delay.

White Garage Corporation, Los Angeles, Cal.; capital $100,000; incorporators, F. Fay Sibley, Martin E. Tew, R. Roy Sibley, C. M. McCully, E. L. Sibley.

Pittsfield Auto Garage Company, Pittsfield, Mass.; capital, $3000; incorporators, Mary I. Mills, Arthur A. Mills, Arthur J. Mills.

Morse, McDonald Company, Boston; capital, $15,000; president, John S. Morse; treasurer, John D. McDonald, 80 Chandler street.

Lawrence & Stanley Company, Boston; capital, $2000; incorporators, Richard F. Stanley, president; Herbert M. Lawrence, 77 Sawyer street, Dorchester, treasurer; Orlando Lawrence.

Stover-Lang Company, Boston; capital, $40,000; incorporators, George H. Lang, Charles L. Stover, 221 Columbus avenue; Norman F. Pratt.

The Motor Accessories Manufacturing Company, Marshalltown, Ia.; capital, $10,000; incorporators, Charles C. Eldridge, Edwin J. Beebe.

The Miles Motor Tire Spring Company, Braddock, Penn.; capital, $200,000; incorporators, Charles W. Dressler, Thomas C. Aten, Charles Balyser, Z. A. Delwarts, Frederick Miles, M. R. Myers.

Krupp Motors Company, Wilmington, Del.; capital, $250,000; incorporators, D. Morgan, G. H. Anderson, James McMorran.

National Spring Tire Company, Chicago; capital, $125,000; incorporators, Charles L. Sigmann, Jr., Louis Valence, Charles H. Jackson, F. J. Karasek.

National Automobile Owners' Alliance, Boston; capital, $50,000; incorporators, W. G. W. Ford, C. E. Becker, S. C. Miller.

Advance Motor Specialties Company, Chicago; capital, $10,000; incorporators, George Heldman, N. A. Street, L. E. Street.

Roanoke Motor Car Company, Inc., Roanoke, Va.; capital, $25,000; president, Frank Welch, Sr.; vice president, J. E. Shickle; secretary and treasurer Frank Welch, Jr.

The American Adjustable Wheel Company, Richmond, Va.; capital, $100,000; president, R. H. Bruce; vice president, Clarence Vadem; treasur[illegible] H. Pinner; secretary, J. C. Davis.

The William H. Bassett C[illegible] Bridgewater, Mass.; capital, $20,000; incorporato[illegible]m H. Bassett, J. Gardner Bassett.

La Salle Auto Sales Company, Chicago; capital, $25,000; incorporators, William R. Watson, George W. Curtis, L. Earle Powell.

Ormond Motor Car Company, Brooklyn; capital, $100,000; incorporators, George H. Howell, Robert McKeller, Thomas Downs.

Long Silent Motor Company, Hannibal, Mo.; capital, $12,000; incorporators, Elmer C. Long, Frank R. Tate, T. Moreno.

Parker Motor Wagon Company, New York City; capital, $10,000; incorporators, Harry C. Cottfried, Drew McKenna, Charles E. Wood, 605 W. 147th street.

Acme Body Company, Rahway, N. J.; capital, $100,000; incorporators, Henry A. Grube, Frank P. Gallagher, George L. Freeman.

United Car Company Chicago; capital, $30,000; incorporators, John S. Lee, 905 First National Bank building, and others.

Excelsior Motor Manufacturing & Supply Company, Chicago; capital, $500,000; incorporators, Ambrose A. Worsley, Max Loehwing, Samuel W. Jackson.

Stark Auto Company, Canton, O.; capital, $20,000; incorporators, W. H. Burgener and others.

Westbrook Garage & Machine Company, Westbrook, Me.; capital, $10,000; president, John T. Skillins; treasurer, Alexander Speirs.

THE KW IGNITION CO
MAGNETOS
RK COILS

New Factory of the K-W Ignition Company, Cleveland, a Fire Proof Structure Throughout, Providing Over Two Acres of Floor Space

The Eckenroth Automobile Livery Company, Cleveland, O.; capital, $5000; incorporators, Rudolph H. Eckenroth, Harry J. Eckenroth, Carlton F. Schultz, Hazel Eckenroth, Peter L. Eckenroth.

American Motor Sales Company, St. Louis, Mo.; capital, $5000; incorporators, president, Clem T. Strauss; vice president, Freen B. Nulsen; secretary and treasurer, C. W. Waughop.

League of American Motorists, Camden, N. J.; capital, $10,000; incorporators, S. Leon Gans, Harry N. Goldsmith, Frank Voight, 635 Linden street, Camden, N. J.

North Shore Transportation Company, Lynn, Mass.; capital, $5000; incorporators, Eben B. Phillips, Patrice Theriault, James J. Liffin.

The Bethel Garage & Plumbing Company, Hartford, Conn.; capital, $2000; incorporators, Ernest L. Taylor, Charles G. Anderson, Robert Halloran, Frederick Kirk, Herbert Leid, Charles Moore.

The Security Motor Switch Company, Detroit; capital, $10,000; incorporators, John E. Cleveland, Albert Meadows, Ezra P. Beechler.

Montana Auto Company, Helena, Mont.; capital, $25,000; incorporators, C. S. Caird, George Baxter, F. G. Benson.

Automatic Motor Devices Company, Milwaukee, Wis.; capital, $1000; incorporators, H. B. Webb, James T. Drought, C. J. Delafield.

Vinita Automobile Company, Vinita, Okla.; capital, $10,000; incorporators, Walter A. Cronan, M. R. Knapp, Mrs. M. R. Knapp.

National Auto Turntable Company, San Francisco, Cal.; capital, $200,000; incorporators, D. F. Ewart, W. H. Buttner, L. Bearden, A. M. Meyenburg.

Frontier Motor Car Company, Buffalo, N. Y.; capital, $5000; incorporators, Elmer Harris, Winfield Graham, V. L. Hagstrom.

Hoof Brothers Company, Springfield, Ill.; capital, $6000; incorporators, Alma C. Hoof, Grace B. Hoof, Harry Hoof.

The Drummond Motor Company, Omaha, Neb.; capital, $50,000; incorporators, James Drummond, W. B. Hughes, L. W. Scheibel, H. W. Yates, Jr.

Swanson Motor Car Company, Springfield, Ill.; capital, $3000; incorporators, Charles E. Swanson, Elmer R. Challenger, Marshall E. Gallion.

Parkway Garage & Auto Supply Company, Chicago; capital, $10,000; incorporators, Walter M. Groves, Charles P. Molthrop, Louis Thorsen.

Carroll Tire Company, Buffalo, N Y.; capital, $20,000; incorporators, John Gregson, George Cunliffe, J. E. Gregson.

Perfection Auto Tire Company, Chicago; capital, $15,000; incorporators, R. E. Cruzen, G. E. Cruzen, D. C. Hutchins.

Mechanical Appliance Company, Chicago; capital, $200,000; incorporators, W. A. Feeny, Frank Venning.

Southern Automobile & Machine Company, Hattiesburg, Miss.; capital, $50,000; incorporators, R. R. Boykin and others.

Empire Gear Company, Indianapolis, Ind.; capital, $20,000; incorporators, Frank S. Clark, Charles H. Hurd.

Detmar Auto Sales Company, New York City; capital, $20,000; incorporators, John McLaren, B. F. Knowlton, Edward C. Underlied.

New England Auto Owners' Association, Springfield, Mass.; incorporators, R. A. McKee, A. W. Warren, M. T. Workman.

Compressed Air Machine Company, Springfield, Ill.; capital, $100,000; incorporators, Lewis C. Kiser and others.

Toledo Auto Delivery Service, Toledo, O.; capital, $10,000; incorporators, Charles K. Freidman, Joseph Strauss, Kittie Alexander, Joseph Alexander, Morris Tobias.

Morse-Readio Automobile Company, Springfield, Mass.; capital, $15,000; incorporators, George U. Readio, Glenn E. Morse, Edward M. White.

White Motor Car Company, Worcester, Mass.; capital, $5000; incorporators, Harvey L. Cashman, Paul M. Hale, T. Francis Manion.

The Whitney, Barney Company, Boston; capital, $100,000; incorporators, Christopher F. Whitney, Charles H. Barney.

Morrill & Higgins Motor Company, Portland, Me.; capital, $10,000; incorporators, Fred S. Higgins, George A. Morrill, A. D. Higgins, E. W. Freeman.

Worcester Elatro Company, Worcester, Mass.; capital, $15,000; president, Fayette A. Amidon; vice president, Ira P. Smith; treasurer, Walter Warren.

Ford Garage & Sales Company, Greensboro, N. C.; capital, $10,000; incorporators, R. L. Markham. W. H. McGlamery, W. M. Combs.

Blakeslee & Norris Company, Thomaston, Conn.; capital, $10,425; incorporators, Henry T. Blakeslee, Frank B. Norris, George H. Freeman.

Yale Auto-Garage Company, New Haven, Conn.; capital, $1000; incorporators, Thomas P. O'Connor, Simeon W. Crompton.

Crim-Bronner Auto Company, Utica, N. Y.; capital, $5000; incorporators, Horace D. Crim, Nellie B. Bronner, Charles W. Crim, Myron G. Bronner.

Hubbard Motor Car Company, Clio, S. C.; capital, $3000; president, J. L. Hubbard; secretary and treasurer. Hugh McLaurin.

Central Motor Company, Brooklyn, N. Y.; capital, $10,000; incorporators, Ralph Dubecq, Arthur M. Beres, H. Barradell.

Meyer-Koch Auto Company, Independence, Ia.; capital, $10,000; incorporators, H. J. Wilson, William H. Koch, O. G. Meyer.

The Koepke Motor Sales Company, Cleveland, O.; capital, $30,000; incorporators, John C. Koepke, Edmund C. Hazel, Emma Koepke, H. P. Brownlee, Elmer G. Derr.

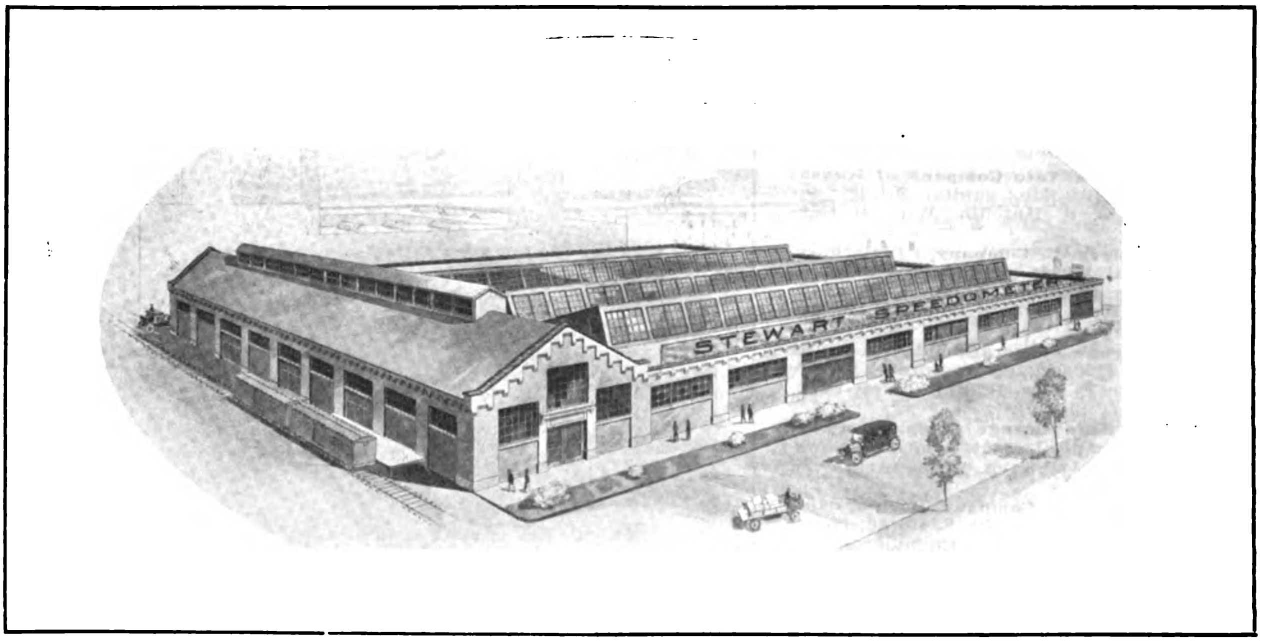
Rex Motor Company, Boston; capital, $1000; incorporators, Harold C. Stetson, Henry W. True, C. Frank Moore.

The Weger Motor Company, Cleveland, O.; capital, $100,000; incorporators, E. C. Rock, J. B. Seymour, E. A. Williamson, F. M. Lamoreaux, J. R. Updike.

The Brooklyn Auto Top Company Brooklyn, N. Y.; capital, $1500; incorporators, Solomon Segall, Benjamin Marvin, Paul C. Bahrenburg.

The Columbia Taxicab Company, Evansville, Ind.; capital, $10,000; incorporators, H. E. Hulesman, W. Wheeler, A. C. Mathias.

The E. L. Brown Automobile Company, Swampscott, Mass.; capital, $25,000; incorporators, Edwin L. Brown, Martin H. Randall, James D. Bee.



New Drop Forging Plant of the Stewart & Clark Manufacturing Co., Chicago, Maker of Stewart Speedometers.

The Automobile Horn & Pump Company, Boston; capital, $25,000; incorporators, Joseph Payne, A. J. Son, Antoni Dubrawski.

The Automobile Omnibus Company, Lynn, Mass.; capital, $10,000; incorporators, Eben B. Phillips, Patrice B. Therlault, James J. Liffin.

The American Elastic Wheel Company, New York City; capital, $50,000; incorporators, C. Feroci, F. Corsi, F. P. Ward.

The Norfolk Automobile Trade Association, Norfolk, Va.; capital, $2500; president, Gray Coburn; secretary, W. S. Broderick; treasurer, J. K. Waterman.

Chestertown Automobile & Garage Company, Chestertown, Md.; capital, $25,000; incorporators, H. Benge Simmons, A. Parks Rasin, L. Bates Russell.

Greenbrier Motor Company, Lewisburg, W. Va.; capital, $10,000; incorporators, Mason Bell, F. H. Campbell, F. M. Arbuckle, K. M. Snyder, W. B. Hines.

Western Massachusetts Cadillac Company, Springfield, Mass., and Windham, Vt.; capital, $10,000; incorporators, Edward R. Clark, Lewis W. Grout, Robert A. Knight.

Gray Specialty Company, Newark, N. J.; capital, $125,000; incorporators, Edward Gray, Edward Gray, Jr., Theodore F. N. Gray, 19 Stratford place.

Queen City Electric Automobile Company, Buffalo, N. Y.; capital, $50,000; incorporators, A. C. Towne, C. S. Chamberlain, M. T. Day.

Moore & Rigby Garage & Sales Company, Cleveland, O.; capital, $10,000; inc[illegible]ors, W. H. and John Moore, Albert T. Rigby, C. [illegible], C. E. Alder.

The Linton Ga[illegible]mpany, Linton, Ind.; capital, $10,000; incorporators, A. T. Custer, G. C. Porter, T. J. Holden.

GARAGE & DEALER

Roy F. Lovejoy, Lowell, Mass., has taken the agency for Hudson cars, made by the Hudson Motor Car Company, Detroit, and will maintain a completely equipped repair shop as well as carry a full line of supplies.

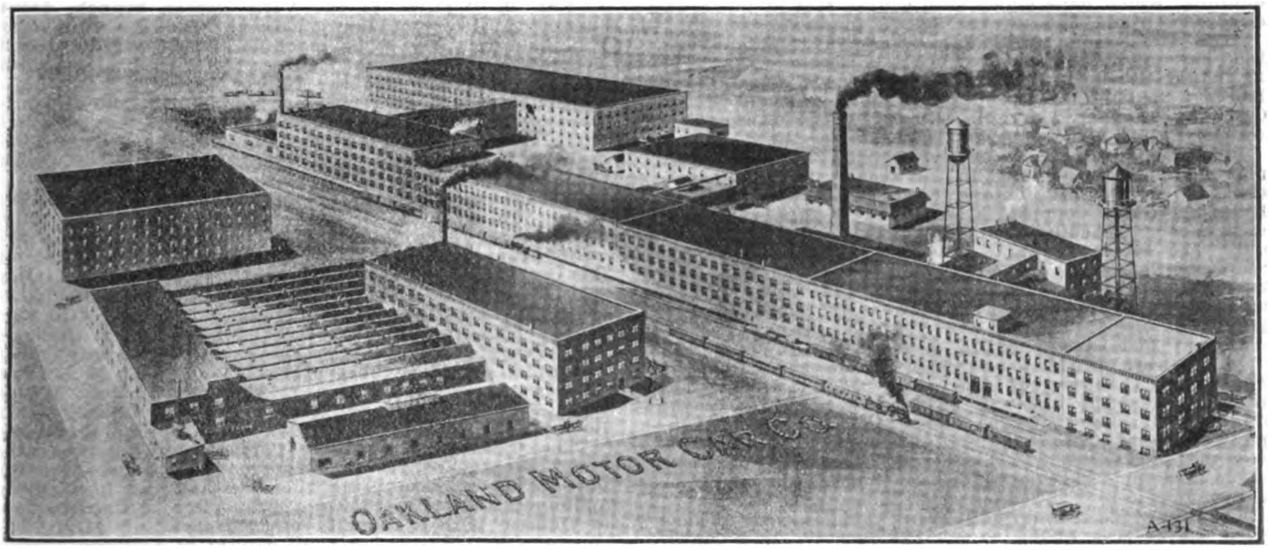
The A. G. Guy Company, Worcester, Mass., agent for lubricating oils, has taken the agency for the Cutting line, made by the Clarke-Carter Automobile Company, Jackson, Mich.

Kirby & Barrett, Hartford, Conn., has leased quarters at 30 High street and these will be remodelled for a salesroom. The concern will maintain its garage on Main street.

The Otto Garage Company, Manistee, Mich., has been organized to take over the business of the Brugman Bros. The following officers of the new concern were elected recently: President, J. L. Sweetnam; vice president, J. H. D. Wallace; secretary and treasurer, B. P. Barnes.

F. H. Edwards, Watertown, N. Y., agent for the Maxwell line, closed a contract recently for an enlargement of his garage at 171 Stone street in that city. The new building will be utilized also as a repository for parts made by the United States Motor Company, New York City, maker of Columbia, Stoddard-Dayton, Maxwell, Brush and Sampson cars.

William Knipper, Rochester, N. Y., the well known racing driver, has taken the agency for the Stutz car, made by the Ideal Motor Car Company, Indianapolis, Ind.



Recent Additions to Plant of Oakland Motor Car Company at Pontiac, Mich., Creating Fifteen Acres of Floor Space.

The Cadillac Automobile Company, New York City, has leased a one-story brick building in the process of erection near 26th street. The property has a frontage of 100 feet and will provide, approximately, 14,000 square feet of floor space.

J. M. Wolf and Emil Bolins have organized the Fairmount Motor Company of Fairmount, Minn., and will occupy a building which will include a salesroom, office and repair shop.

The Duncombe Auto Company, Fort Dodge, Ia., has postponed the erection of its new garage until spring because of the inclemency of the weather. The new structure will cost $10,000 and will be three stories in height and of cement blocks.

William Parkinson, handling the Stutz line, has leased a salesroom at 1655 Broadway, New York City. The concern will be known as the Stutz Motor Car Company.

A. H. Sowers has joined the Boston sales agency of the Jackson line, made by the Jackson Automobile Company, Jackson, Mich. He was formerly a member of the Sowers-Soden Company of that city.

Col. Grantley P. Postles, Wilmington, Del., has leased the garage and show rooms at 220 West Tenth street and has associated himself with Coleman B. Harris, agent for the Cadillac car. The concern will also handle a full line of electric and gasoline pleasure and commercial vehicles.

Henry P. Bryant has acquired the interest of Harry Garrison in the Marshall Motor Company of Marshall, Mo., and will have charge of the entire business hereafter.

The Merchants Auto Company, Indianapolis, Ind., has leased for a term of years, the newly erected garage at 9 East Pratt street, known as the Colonnade. A change is announced in the management, E. Frank Brown succeeding H. B. Stout, Jr.

D. T. Potter of Bowling Green, Ky., has entered the employ of the Phoenix Motor Car Company of Lexington, Ky.

The Virginia Automobile Garage & Repair Corporation, organized recently, has opened a garage and repair shop at 158 West Main street, Norfolk, Va. The officers of the company include: President, H. L. Page; vice president and general manager, Archie M. Bopp; secretary and treasurer P. A. Page.

Reginald Thomas, who drove one of the Metz cars in the recent Glidden tour, has joined the sales force of the Hollander Company, Boston distributors of that line, made by the Metz Company, Waltham, Mass.

Roscoe B. Davis, well known in motor car circles in Boston, has joined the sales force of the Empire Motor Company of that city. In addition to the Empire the company acts as distributor of the Stutz car.

B. Black & Son, Thomasville, S. C., has secured property on Main street and will erect a building suitable for the repairing and handling of motor car tires.

A. L. Starin of New Haven, Conn., is having plans drawn for a garage at Broad and Commerce streets in that city. It will be a brick structure, two stories in height of steel and concrete.

The American-Marion Sales Company, New York City, moved recently from 1776 Broadway to new quarters at Broadway and 63rd street. A formal housewarming will be given.

H. H. Snyder, Bozeman, Mon., has taken the agency for the Day line, made by the Day Automobile Company, Detroit.

The Buick-Keating Company, consisting of P. L. Keating of Oswego, and J. O. Bradeen, has been formed at Syracuse, N. Y., to handle the Buick line, made by the Buick Motor Company, Flint, Mich.

Frank Staley of Pittsfield, Mass., has closed a contract with the Hupp Corporation of Detroit, for the distribution of the new R. C. H. cars in Indiana and part of Illinois. He will establish headquarters at 513 North Capital avenue, Indianapolis, Ind.

The Simplex Automobile Company, New York City, announces that it will move to new quarters in the Ehret building, 59th street, east of Broadway.

Coughlin & Davis, Seventh avenue and Walnut street, Cincinnati, O., have installed machinery for the purpose of repairing speedometers. The department will be in charge of E. R. Marsh, who served some time with the Stewart & Clark Manufacturing Company, Chicago.

George W. Garland, Jr., has taken over the interest of Edward and George Strobel in the Garland Automobile Company, 1657 Broadway, New York City.

S. A. Foster & Co., Hartford, Conn., agent for the Rambler, Regal and American cars, has removed to a new garage and repair shop at 20 Elm street. The new location provides an excellent salesroom.

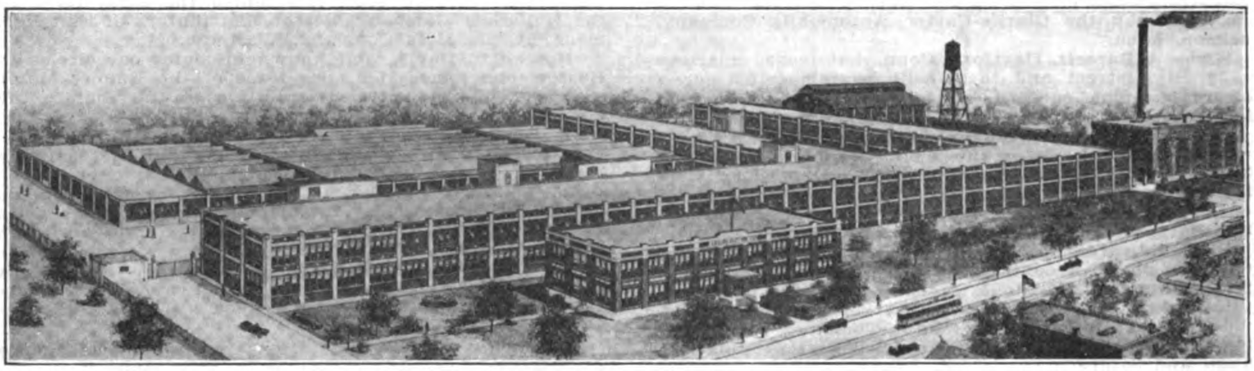
L. Kirkegard, Sioux City, Ia., has opened a garage and repair shop and will represent the Oakland, R. C. H., and Firestone-Columbus.

Leiss & Curtis has opened the Empire Garage at 124 Main street, New Rochelle, N. Y. Both members of the firm have had a long experience in the motor car industry, Mr. Leiss having had a garage at 232 Cedar road.

Ralph S. Jones has purchased the business of the Fishkill Motor Car Company, Fishkill Landing, N. Y., and the garage which is undergoing alterations. C. F. Aldridge will be manager and J. J. Wedick will have charge of the mechanical department.

WITH THE MANUFACTURER

The Bosch Magneto Company, New York City, announces a change in offices whereby the advertising and publicity department will be located at main office, and that at 54th street will be discontinued. A. H. Bartsch will be in charge as heretofore. The change has been made possible by extensive alterations throughout the building, which have added 5000 square feet of much desired office room, and required by the increasing business.



Detroit Plant of the Losier Motor Company Which Is Constructed of Concrete and Steel and Where Over 1000 Men Are Employed.

The Henderson Motor Sales Company, Indianapolis, Ind., has appointed the following new Cole agencies: W. R. Griffin, Stockton, Cal.; Leadley Brothers, Rozel, Kan.; Herbert Ellis, 24 Amesbury street, Lawrence, Mass.; Gist Auto Company, Arcadia, Ind.; Kewanee Garage, Kewanee, Ill.; R. Bruce Carson, Hagerstown, Md.

The Losier Motor Company, Detroit, maintains two plants which are depicted in the accompanying illustrations. The Detroit factory is constructed under the Hahn steel and concrete system and is fitted with the most modern machinery, all of which is less than a year old. The Pittsburg plant produces the iron, steel and aluminum castings and employs over 600 hands. The rear axles, hubs, pumps, etc., are built here and it acts as a feeder to the main works. Over 1000 men are employed at the latter and the combined output is estimated at 1000 cars annually.

C. F. Pratt, president and general manager of the Ohio Motor Car Company of Cincinnati, O., announces that the Ohio gasoline line will be handled hereafter in the Canadian territory by the American Motor Sales Company, Toronto. Ground already has been broken for a new building which will house the Canadian concern and serve also for a factory service station for the Ohio machine.

The New York Lubricating Oil Company, New York City, states that owing to a large increase in business in the Middle West, the branch in Chicago at 1436 Michigan avenue has been removed to 1549, where larger quarters have been secured.

H. T. Boulden, sales manager of the Ohio Motor Car Company has reorganized the sales department and hereafter the service department will be under the direct supervision of the sales manager. Five factory service depots are to be established in as many parts of the country. These will carry a full line of parts and will have a factory mechanic for installation.

The Velie Motor Vehicle Company, Moline, Ill., entertained dealers, and branch house managers at a convention in that city recently. Meetings were held in the assembly hall and addresses were made by the heads of the different departments, including Chief Engineer C. B. Rose; Major L. M. Fuller, general manager; George H. Lloyd, sales manager, and his assistant, Charles P. Hatter. Later in the week a banquet was tendered the visitors at the Manufacturers' hotel, after which the party was escorted to the theatre in automobiles. Another banquet was given later at the Davenport Club, Davenport, Ia.

The Colby Motor Company, Mason City, Ia., has added Connecticut shock absorbers, made by the Connecticut Shock Absorber Company, Meriden, Conn., to the regular equipment of the 1912 30 horsepower Colby car.

Arthur H. Blanchard, M. Am. Soc. C. E., consulting highway engineer, formerly of Providence, R. I., announces the removal of his office and laboratory to the corner of Broadway and 117th street, New York City.

Ray B. Wiggins of the Velie Boston branch, drove the official pace making car in the Chicago reliability run, held recently. The machine, which carried David Beecroft, president of the Chicago Motor Club, was loaned by Morton H. Luce to the referee.

The Ohio Motor Car Company announces the appointment of the following agencies: William S. Lee, Wilkesbarre, Penn.; Zust Motor Company, New York City; Federal Motor Car Company, Pittsburg, Penn.; C. H. Dean Company, San Antonio, Tex.

Montgomery Hallowell, general advertising manager of the United States Motor Company, New York City, has resigned to join the forces of the H. E. Lesan Advertising Agency, where he will assist in the handling of the United States Motor Company's advertising. Gridley Adams, formerly advertising manager of the Stoddard-Dayton division, has been appointed to succeed him. Mr. Hallowell's associates tendered him a banquet at Sherry's and presented him with a handsome mahogany cigar humidifier. Among those present were: Alfred Reeves, Gridley Adams, H. E. Lesan, E. M. West, W. McK. White, M. J. Adams, M. H. Newton, L. A. Van Patten, Berry Rockwell, F. E. Dayton, Harry Pruden, Joseph Kathrens.

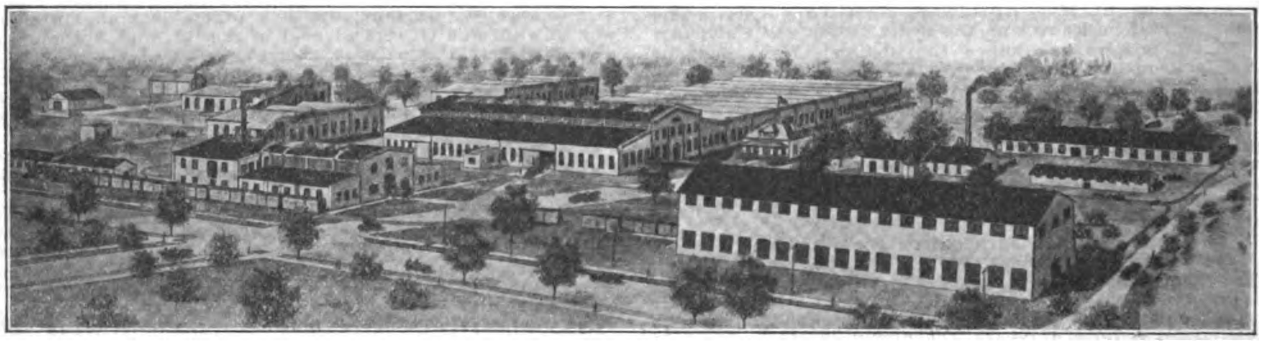
The Overland Automobile Company of Canada, Ltd., which secured Dominion letters patent in June for the purpose of manufacturing the Overland car in Canada, announces that it will build a large plant in the province of Ontario with a capacity of 1000 cars annually. The company will have a paid up capital of $250,000.

The International Automobile League Tire & Rubber Company, Buffalo, N. Y., will erect a $600,000 plant on land secured at Northland avenue and Chelsea street, according to an announcement made by its president, A. C. Bidwell. The building is expected to be completed in about four months.

H. C. Lathrop has been elected secretary and treasurer of the Henderson Motor Sales Company, Indianapolis, Ind., to succeed his father, Dr. H. L. Lathrop, who severed his active connection with the company to devote his time to the banking business.

The Oakland Motor Car Company's New York branch has removed to 1600 Broadway and will be in charge of Roger R. Hall.

Charles W. Sponsel of Hartford, Conn., has been appointed factory manager of the Pierce Motor Company. The manufacturing plant is located at Racine, Wis.



Pittsburg, Penn., Factory of Losier Motor Company Which Produces Units Assembled at Detroit.

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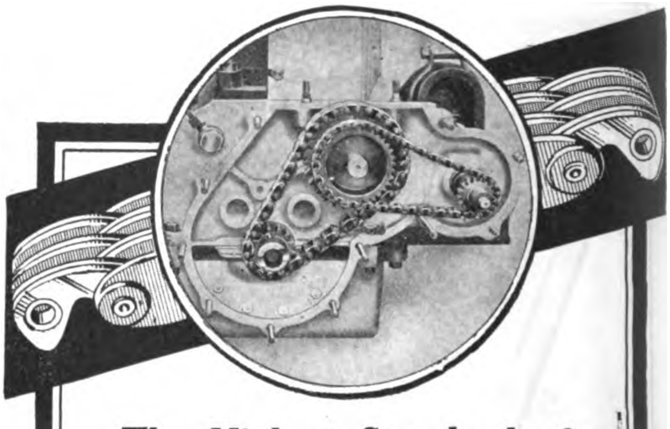

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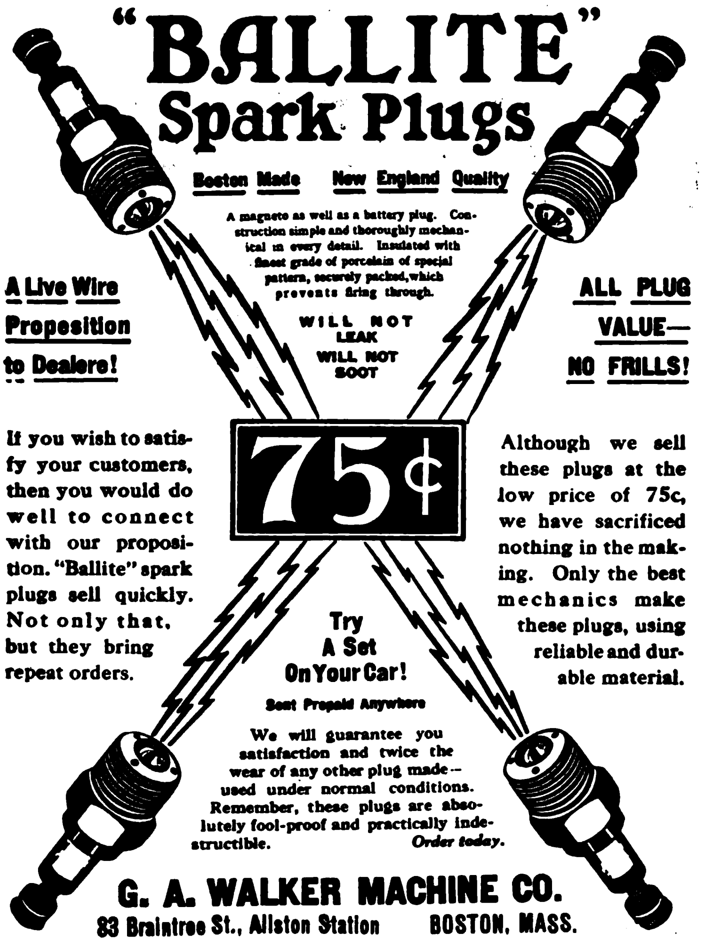

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Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Frontier Specialty Co., 734 Main St., Buffalo, N. Y. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Herz & Co., 295 Lafayette St., New York City (Bougie Mercedes.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Mac-Kae Manufacturing Co., Boston, Mass. (Mac-Kae.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Mac-Kae Mfg. Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORDING DEVICES.

Casgrain Speedometer Co., 172 Columbus Ave., Boston, Mass.
Branches: 1919 Broadway, New York City; 2031 Euclid Ave., Cleveland, O.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York City; 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)
Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.;

BUYERS' GUIDE---Concluded

1213 South Main St., Los Angeles, Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 870 Woodward Ave., Detroit, Mich.; 330½ North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3928 Olive St., St. Louis, Mo.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Ideal Oil Pump & Tank Co., 146 Summer St., Boston, Mass.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Ignition Co., 2829 Chester Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Gilbert Manufacturing Co., The, New Haven, Conn. (Gilbert.)

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St.. Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Empire Tire Co., Trenton, N. J.
Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago. Ill.; 842 Woodward Ave., Detroit, Mich.: 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City: 148 Chambers St., New York City; 322 North Broad St., Philadelphia, Penn.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston, Mass.; 17½ Dorrance St., Providence, R. I.

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In principal cities.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

Western Automobile Supply Co., 3900 Sheridan road, Chicago, Ill. (Auto Inner Casings.)

TIRE INFLATING TANKS.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PROTECTORS.

New Tyr Manufacturing Co., 771 Lexington Ave., New York City. (New Tyr.)

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Chicago, Detroit, Kansas City.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tire Casings and Inner Tubes.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass.
Branches: See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York City.
Branches: See Rims—Removable and Detachable.

TIRE TOOLS AND REMOVING EQUIPMENT.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York City.

TRUCK BODIES.

Lynch Manufacturing Co., East Side Station, Chicago, Ill.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Lansing Co., formerly **Lansing Wheelbarow Co., Lansing, Mich.**
Branches: Factory, Parkin, Ark.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Pitless Auto Turntable Co., Kansas City, Mo.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, Hartford, Conn. (Kant-Break.)

VALVE DRESSERS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y.

VALVE STEM ADJUSTORS.

Auto Parts Co., Motor Ave., Providence, R. I. (Apco.)

VARNISHES FOR AUTOMOBILE BODIES.

U-Auto-Varnish Co., Cleveland, O.
Branch: 218 Columbus Ave., Boston, Mass.

VULCANIZERS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Garage and Individual.)
Branches: In all principal cities.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WINDSHIELDS AND WIND[illegible]LD CLEANERS.

Conover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, Geo. A., Taunton, Mass.

Walworth Mfg. Co., Boston, Mass. (Stillson.)

THE ACCESSORY -AND- GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. I. PAWTUCKET, R. I., FEBRUARY, 1912. No. 4

PUBLISHERS' WILD DASH FOR "TRADE."

Publications Long Devoted to Other Interests Stampede at the Recognition by Some of the Industry of the Real Merits of the "Glad Hand" and "Goodfellowship"--Policies Changed in Twinkling.

THE trade publications, the fields they fill, the needs they serve and the purposes they accomplish, are receiving the attention of the large interests of the motor vehicle and allied industries. Careful inquiry has been directed toward all of these prints, largely because of the representations made relative to them by those responsible for their conduct. This investigation, if such it may be termed, has resulted from a condition precipitated by the lightning changes made by some of the publishers to establish claims for recognition.

And primarily it all depends upon what is and what is not as applied to the purpose or character of the print. There are numerous classifications, these including those for the owner, for the industry as represented by the manufacturers, for the trade as representing the agents and distributors for cars, and for the entire industry by including all these interests save the owners. Now it is well enough known that of these classes there are those which essay to be either general or sectional in their scope, and that of these divisions there must be a substantial reason for recognition to be given by the public.

There has been recently a disposition by some of the largest purchasers of publicity to devote their inquiries toward the especial fields of some of the prints that are published in the metropolis, and this, together with the mystifying transitions of the publishers, has brought about a situation as peculiar as it is bewildering. For reasons that do not need specification, publications that were very strong in their claims to distribution among owners of motor vehicles, in the twinkling of an eye became the strongest of trade prints, and, seemingly without realization by the industry that to become established and secure actual prestige is a work for years.

There is nothing remarkable in a change of policy with the average magazine, but it is absolutely impossible for a publisher to make what he pleases, when he pleases and where he pleases. It requires long periods of endeavor to establish clienteles of readers and advertisers and there must be a sufficient and continued interest by either element. To change from one class to the other is an undertaking that must be thoroughly prepared for and then, more important than anything else, the public, not the advertisers, must be thoroughly informed.

That the public must be dealt with is evident from the fact that any publication, no matter how well supported by advertisers, would be a failure without readers, because it would not afford such publicity as would warrant advertising support. This being so it is simply an impossibility for a magazine to be transformed as has been stated, and have a publicity value that would justify its receiving recognition. Not only this, but it must also be apparent that there could not have been the merit and quality claimed for the print in its first form, for had there been there would be comparatively little, if any, reason to make the complete change of policy.

Yet on the face of these indubitable facts it is evident that the experience of the industry, as reflected by the publications referred to, has been quite the reverse, for, with the activity of one magazine to secure recognition by the trade, others with remarkable alacrity "threw their hats into the ring" and stampeded for the "trade," leaving the "owners," "general," "national" and other interests dead, dying or willing to die. That is, there was a mad rush for the "trade" because of the seeming success of the first print in securing business. With all this came the creation of expensive organizations of advertising solicitors, whose principal occupation appears to be keeping out of each other's way, and visiting the advertisers and soliciting "copy" on the basis of "personality" and a handshake—not upon the merit of the publications as mediums for publicity.

This condition (the friendship call and the goodfellowship) might be expected to bear fruit once or twice, but it is hardly probable that any business enterprise is a charitable institution and can afford to continue this indefinitely. Yet, surprising as it may appear, there has been a greater realization upon the "trade" representation than might be expected, a sufficient indication that there is by no means the attention directed toward the selection of publicity that should be given.

Perhaps it may not have occurred to the advertisers that there is a limit to the expense that can be legitimately incurred, because no matter how much business was secured if it was at a prohibitive cost there would at least be loss to the publisher. There may be instances where an organization may be created for development of business, and its activity may add stimulus to competition, but it is seldom, if ever, that the cultivation of one element of an in-

For Additional Trade Information See Pages 36, 37, 38, 39, 40.

dustry will result in a "Klondike-like" dash that has seemingly firmly established these publications removed and remote from those interests they formerly served.

But no matter what conclusions may be reached by the observer it is a fact that "trade" seemingly means anything desired, and does not imply the publication of trade information when applied to a magazine. Of course industrial intelligence may not have to all the same relative importance, but it is neither practical nor logical to make claim to an attitude or prestige without at least a substantial foundation. It is also apparent that the interests of the "trade" are so large that the scope of the publication devoted to it must be broad enough to include them all if it is desired to justify a united support.

WANTS FOUR-WHEEL DRIVE PATENTS.

General Electric Company Negotiating for Church Balance Gear Rights.

THE General Electric Company, the largest concern of its kind in the world, is negotiating with M. B. Church of Grand Rapids, Mich., with a view of acquiring the six patents covering the four-wheel drive system owned by the Church Balance Gear Company, Grand Rapids, Mich. Mr. Church's prominence is due to the fact that he is owner of the controlling interest in the company. The most important of these patents is No. 856,943, issued to M. B. Church and Karsten Knudsen June 11, 1907, which relates specifically to the device that evens or equalizes the application of the motive power. The Couple-Gear Freight-Wheel Company, Grand Rapids, has exclusive license to construct industrial vehicles under the patents, and this concern is a large factor in the negotiations.

The General Vehicle Company is a subsidiary corporation of the General Electric Company, and the former named concern is probably the largest maker of electric motor service wagons in America. The Church patent covers individual motors attached to the four vehicle axles and these motors turn shafts extending to the inner circumference of the wheels, the shafts carrying pinions that mesh with racks incorporated with the inner face of the rims. Instead of the usual spokes the wheels are composed of two large discs to which are attached the rims and the tires. The motor, shafts, pinions and racks are entirely enclosed in the assembled wheel. The motors are driven by current from a vehicle storage battery, or from a current for which energy is generated by a gasoline engine suitably installed in the vehicle.

The value of the device is not confined to vehicles alone, for it is claimed that it will give admirable results when utilized for innumerable purposes. The drive has been used practically for more than six years and a considerable number of the Couple-Gear service wagons are in use in different sections of the country.

NEW CARS AND SERVICE WAGONS.

Woolson to Build Two-Ton Wagon.

A two-ton service wagon is to be built by the Woolson Auto Truck Company, Riverton, N. J., of which concern C. T. Woolson is the principal owner.

Belmobile Makes Its Debut.

The Belmobile is a new popular-priced runabout to be placed in the market. It is built by the Bell Motor Car Company, Detroit, Mich., which concern is headed by W. D. Bell, who was for three years with the Peerless Motor Car Company, and H. R. Fordyce, well known to the Western motor car industry. The Belmobile has a four-cylinder engine with bore of 3.25 inches and stroke of 3.375 inches, and is rated at 20 horsepower. It is equipped with a Bosch high-tension magneto and with selective sliding gear speed change, giving two forward ratios and reverse. The clutch is multiple disc. The drive is by propeller shaft. The machine is sold fully equipped.

The Mooers Automobile Company has secured a factory at Trenton, N. J., and will immediately begin the manufacture of a six-cylinder pleasure car.

REORGANIZATION PLANS.

Excelsior Makes New Start.

The reorganization of the Excelsior Motor and Manufacturing Company, Chicago, Ill., which has capital of $500,000 has been accomplished. The original concern was the Excelsior Supply Company, and later the Excelsior Motor and Manufacturing Company was formed to manufacture motorcycles. The new concern takes over the business of the two.

New Men and New Factory for Empire.

The plans for the reorganization of the Empire Motor Car Company, Indianapolis, Ind., are making and it is is expected, with the withdrawal of Carl G. Fisher and James A. Allison, two of the founders of the concern, who desire to direct their activities elsewhere, that Cecil E. Gibson, one of Mr. Fisher's business associates, will be elected president, and that B. W. Twyman of Columbus, O., will be one of the principal stockholders and directors. As the Prest-O-Lite starter is now made in the Empire factory it is probable that a new plant will be secured.

Reorganizers Propose Electric Motorette.

Those concerned in the reorganization of the C. W. Kelsey Manufacturing Company, Hartford, Conn., have announced that the motorette model will be continued and that in addition an electric model will be produced. There will be a slight reduction of the price of the regular model, while the electric machine will be sold for about three times the cost of the gasoline vehicle.

WANTS PROCESSES WITH THE PATENTS.

Valveless Inner Tube Company Brings Peculiar Suit Against Parent Corporation.

THE Valveless Inner Tube Company has begun suit against the Sealomatics Syndicate, Ltd., of London, England, in the United States District Court for the Southern District of New York to secure an injunction preventing the defendant corporation disposing of the rights to certain processes, necessary in the manufacture of valveless tubes, to any person or company in the United States except the complaining corporation. It is claimed that the right to use these processes was purchased by the plaintiff.

The case involves the patent of William James Therold of London, who assigned his rights to the Sealomatics Parent Syndicate, and this concern later made agreement with George Wishart to exploit the tubes in the United States, it being provided in the contract that Wishart should have option on the United States patents that were to be applied for. These patents were issued.

Wishart then transferred his rights to the Valveless Inner Tube Company and preparations were made to manufacture the tubes at the works of the Walpole Rubber Company, Walpole, Mass. It was then learned that the tubes could not be produced without knowledge of the secret processes, which processes the English syndicate refuses to disclose. It was then believed that the Sealomatics Syndicate was negotiating with others for the sale of the secret processes, and the proceedings were instituted to enjoin the transfer of the necessary rights.

For Additional Trade Information See Pages 36, 37, 38, 39, 40.

INCREASES OF CAPITAL, MADE AND PROPOSED.

De Tamble Company Issues New Stock.

The De Tamble Motors Company, Anderson, Ind., has increased its capital to $200,000 and of this $101,000 has been acquired by James W. Sansberry and associates, and Mr. Sansberry has been given the general management of the business. He succeeded Charles H. Walters, who continues with the company as general superintendent.

Capitalization of Racine Company Doubled.

The capital of the Racine Manufacturing Company, Racine, Wis., has been increased from $400,000 to $800,000. The company claims to have the largest exclusive automobile body manufactory in the world. The president of the company is F. K. Bull, president of the J. I. Case Threshing Machine Company, and the secretary is J. W. Gilson, formerly assistant secretary and sales manager for the Mitchell-Lewis Motor Company. G. W. Jagers is treasurer and Harold Smith secretary of the organization.

Big Plans for Vacuum Oil Company.

The stockholders of the Vacuum Oil Company will meet in New York, N. Y., Feb. 29 to determine a proposal to increase the capital to $15,000,000 from $2,500,000, and to increase the number of directors from five to eight. The company has a bonded debt of $2,000,000 and a further debt of $8,000,000 due the Standard Oil Company of New Jersey, which is to be paid with the proceeds of the sale of stock, which is to be issued on a basis of five shares for each share now held by a stockholder. At the last annual statement made by the company, June 30, 1911, the assets of the company were $25,033,526, and the surplus was $11,429,034.

NEW PLANTS, BUILDING OR BUILT.

Has Steel Contract for Stevens-Duryea.

The American Bridge Company has contract with the Stevens-Duryea Company to deliver 4000 tons of structural steel, which is to be used in the construction of a new factory at East Springfield, Mass., early in April. The work is to be begun as early as weather conditions will permit.

King Company Gets Old Hupp Factory.

The present factory of the Hupp Motor Car Company, Jefferson and Concord avenues, Detroit, Mich., which was erected in 1909 and has about 70,000 square feet of floor space, is to pass into the possession of the King Motor Car Company when it is vacated by the Hupp company to occupy its new factory. The change will be made within the next two months.

MAINTAINS PATENTS ARE INVALID.

Standard Welding Company to Disregard License from United Rim Company

The Standard Welding Company, Cleveland, O., which has been making three types of automobile vehicle wheel rim under license from the United Rim Company, has discontinued the manufacture of two of these and will make the third, with the addition of some forms of its own creation, but will disregard the license formerly held for the rim that is to be made, maintaining the patents controlling it are invalid. The United Rim Company holds patents that represent a compromise of several large tire manufacturing companies with a view of standardizing quick detachable and demountable wheel rims, the organization being made to eliminate controversy and friction.

WILL BUY KNIGHT MOTORS ABROAD.

Edwards Company Not to Locate Until Executive Returns From Europe.

H. J. Edwards, who with C. G. Stoddard has organized the Edwards Motor Car Company, to engage in the manufacture of cars and service wagons, will sail in a few days for England to make the necessary arrangements for the Knight engines which are to be used in these machines. The location of the company has not been decided as yet, but it is probable that it will be in Indianapolis, Ind., where a considerable amount of stock has been subscribed with the understanding that the plant will be placed in that city. No location will be determined until the return of Mr. Edwards from England. The plans of the company so far as outlined include the production of either worm or bevel gear driven machines with Knight engines for the power plants. Offices have been established temporarily in the Knabe building, 439 Fifth avenue, New York, N. Y.

NEW CONCERNS IN THE INDUSTRY.

Will Make Forgings at Detroit.

With authorized capital of $100,000 the Automobile Forgings Company has been organized at Detroit, Mich., and established a factory at 33 Richmond street, that city. George W. Strelinger is president and G. W. Vandeveer vice president of the organization.

Fordham Heads Steinbock Company.

The Steinbock Engineering Company, which has been incorporated with capital of $1,000,000 under New Jersey law to engage in business at Peekskill, N. Y., has for president E. J. Fordham, H. E. Steinbock vice president, and F. B. Knowlton secretary-treasurer. The company is to manufacture pleasure cars.

Gas-Electric Trucks at Toronto.

Gaselectric Motors, Ltd., a corporation with capitalization of $1,000,000 has been organized at Toronto, with E. H. Thomas president, B. F. Honsinger vice president and H. S. Slate secretary and treasurer. The purpose of the company is to build vehicles which will be driven by motors fixed to the axles and with power generated by gasoline motors.

To Specialize Motor Truck Bodies.

The Motor Truck Body Company has been organized at Detroit, Mich., with Fred Proctor president, E. T. Hangstefer secretary and treasurer, and Harry A. Carie manufacturing manager, to manufacture bodies for power wagons. All incorporators were formerly engaged in the body department of the Packard Motor Car Company. The company has established its plant at 320-22 Franklin avenue.

Claims Valve Saves Carburetion.

The American Compensating Valve Company has been incorporated at Manitowoc, Wis., by Ludwig Stupecky, Stanley D. Eckells and Charles Zeman, with capital of $25,000, to manufacture a device invented by Stupecky and patented in the United States, Canada, Great Britain, Germany and France, which is installed in the carburetor in the place of the usual air valve. It is claimed that this eliminates the usual defects in carburetion.

New Truck to Be Built at Louisville.

The Transit truck is to be manufactured at Louisville, Ky., by the Transit Motor Truck Company, which has been organized with capital of $20,000 by W. B. Young, George H. Laib and E. G. Walker.

The three-story addition to the plant of the Chase Motor Truck Company, in Wyoming street, Syracuse, N. Y., is nearly ready for occupancy. It will considerably increase the facilities of the company.

For Additional Trade Information See Pages 36, 37, 38, 39, 40.

CORBIN COMPANY TO DISCONTINUE.

Abandons Manufacturing and Will Merely Produce Parts Needed for Cars in Use.

THE Corbin Motor Vehicle Corporation, New Britain, Conn., a subsidiary of the American Hardware Corporation, has disposed of all the cars it had manufactured to the Miner Garage Company, Hartford, Conn., and has discontinued the production of automobiles, although by the terms of the sale it will maintain its garage and repair shop at New Britain, and will either carry in stock or will produce whatever parts may be necessary for replacement or restoration during the five years ensuing from the date of the sale; perhaps for a longer period. So far as is known the company will exist during the period of the contract as now, for there has been no inclination to dispose of it, but the factory will be devoted to other lines of manufacture, as will the machine facilities, so far as this is possible.

The Corbin Motor Vehicle Corporation was organized about eight years since to manufacture a car with an air-cooled engine. After several years experience the first water-cooled machine was built and later on the larger, or the 40 horsepower vehicle, was produced. The head of the company, aside from one brief period, has been Maxwell S. Hart, and Guy Hutchinson has been during the same periods secretary and director of sales.

There is a belief that Messrs. Hart and Hutchinson will continue in the industry and may be directly concerned in the production of another car, for experiments have been made which seemingly establish foundation for such a conclusion.

WITH CORPORATIONS AND THEIR OFFICERS.

The Billings & Spencer Company.

The Billings & Spencer Company, Hartford, Conn., will hold its annual election Feb. 19. It is probable there will be no change of the officers.

Mulholland Is Chosen President.

Arthur E. Mulholland was chosen president, John Allen vice president and John T. Lombard treasurer of the Hastings Motor Shaft Company, Hastings, Mich., at the annual meeting of that concern.

Kuhner Company to Build Vehicles.

H. E. Kuhner is president, Alexis G. Pascault vice president, William B. Shannahan treasurer and George M. Wingard secretary, of the Kuhner Engine Company, Oxford, Md., which concern is to manufacture power wagons. The first products are planned to be a delivery wagon and a light truck for farm work.

Walsh Heads Newark Company.

The Newark Automobile Manufacturing Company, Newark, N. J., maker of the Newark truck, has elected these officers: John T. Walsh, president; John W. Philips, vice president; H. V. Radonitz, secretary-treasurer; Roland D. Crocker, counsel; John T. Walsh, John W. Philips, H. V. Radonitz, David King, Carl W. Johnson, W. B. Abbey, Roland C. Crocker, Chester A. Jones and Bela Cukor.

Humpage Succeeds Chalfant.

F. R. Humpage has succeeded to the presidency of the E. R. Thomas Motor Car Company, Buffalo, N. Y., from which E. P. Chalfant has retired to engage in business in New York. W. L. Gleason has been elected vice president of the company. There will be no other changes. J. J. Ramsey remains secretary and treasurer. Mr. Chalfant was executive of the Waltham Manufacturing Company when he was made general manager of the Association of Licensed Automobile Manufacturers, and he resigned that position to associate himself with the Packard Motor Car Company. Later, with Messrs. Gleason and Ramsey he went from the Packard company to the Thomas company.

BUSINESS TROUBLES AND LITIGATION.

Richmond Iron Works Bankrupt.

With assets claimed to be $111,351.90 and liabilities amounting to $67,577.96 the Richmond Iron Works Corporation, Richmond, Va., filed a voluntary petition in bankruptcy in the United States District Court at Richmond, which resulted in the appointment of M. H. D. Eichelberger as receiver. The company is said to own real estate valued at $75,000. The company built the Virginian car and failing to realize the success anticipated, it was decided to discontinue business.

Cameron Company in Receiver's Hands.

The affairs of the Cameron Motor Car Company, with main office and plant at Beverly, Mass., have been placed in the hands of a receiver as a result of bankruptcy proceedings instituted by some of its creditors. E. Howard Perley has charge of the company's business and it is probable that within a short time a statement of assets and liabilities will be made. The company made an offer of 10 per cent. to its creditors, which was not accepted and the proceedings were continued.

Breach of Contract Claimed.

The British Aluminum Company, Ltd., has instituted suit against the United States McAdamite Metal Company in the New York Supreme Court to recover $4368 with costs and interest, this being the amount claimed for an alleged breach of contract by the defendant. It is maintained that the contract involved the delivery of 100 tons of pure aluminum in ingots. at a price of 21 cents a pound, and after the delivery of 35 tons refused to order any of the 65 tons remaining contracted for. The plaintiff seeks to recover the difference between the market price of 17.5 cents a pound as of Dec. 31, 1911, and the 21 cents a pound as contracted for, for the 65 tons or metal not ordered.

FLANDERS ABSORBS UNIVERSAL.

The Flanders Manufacturing Company, Pontiac, Mich., which now operates an electric pleasure car and service wagon plant, a screw machine works, a motorcycle factory and a drop forge and a gear shop, is to absorb the Universal Motor Truck Company, Detroit, Mich., if plans now making are realised. The merger has been made with Howard T. Walton, who was head of the Universal Motor Car Company of New York, agent for the Universal trucks in the metropolis, as the principal, this following the purchase of the truck company by New York interests. A. O. Smith of Milwaukee, Wis., and George Uhlein of the same city are said to be heavily interested in the Flanders company.

WHOLESALE ONLY AT U. S. TIRE BRANCHES.

Products Will Be Distributed, but Not Sold at Retail by the Company.

The United States Tire Company, of which the Hartford, Continental, G & J and Morgan & Wright companies are constituents, has reorganized its method of distribution in that it will sell only at wholesale at its branch establishments, wherever these may be, and all retail sales are now made by dealers and other representatives. The adoption of this policy is to secure the co-operation of all distributors alike and to insure to them equality of profit upon the volume of business transacted. This eliminates any possibility of competition between the company and its agents.

For Additional Trade Information See Pages 36, 37, 38, 39, 40.

SYSTEMATIC GARAGE MANAGEMENT.

Practical Methods for Accounting for Stock and Time of Workmen, and Establishing the Relative Income, Expense and Profit for Each Department, Proposed for the Business Now Lacking Such Precise Detail Information.

THE systematic conduct of garage businesses is assuming greater importance with every owner or manager as the subject is given consideration. It is realized that it is necessary to economize time, material and labor and to establish such protection as is required to effectually prevent leakage or waste with a minimum of record. It is absolutely essential, however, to have accurate note to justify any determination. It is only possible to learn of progression through comparison and this establishes the need of references that will supply every fact.

A system suggested by H. D. Brunell, 320 Witherbee street, Flint, Mich., and which is in part supplied by him, is designed to be applied to an existing method of accounting and is conceived with a view of economizing stock and time in the repairing department, while he suggests a means of recording the receipts from and the cost of each car disposed of. This suggestion assumes that the garage is agent for one or more cars.

Mr. Brunell takes for granted the existence of certain necessary books for record, such as cash book, journal, general ledger, stock ledger, stock book, and the like, and also the conduct of the usual general accounts. He also presupposes an accounting of overhead expense, which he defines to include all nonproductive labor, rent, insurance, taxes, interest, incidentals, etc., to be kept under separate ledger accounts.

In his suggested record Mr. Brunell proposes that each form contain the detail essential for both instruction and accounting, using the fewest number of forms that is compatible with accuracy and completeness. Assuming that the business is repairing and selling cars, and that storage and the sale of accessories are not considered, he provides for recording the two former.

Considering the repairing he provides for a repair order that is made in triplicate, the original to go to the customer, if cash is paid for the work, the second to the office and the third to the repair envelope. By noting the accompanying form it will be seen that each order is given a serial number when entered and, if the work is on a car, the number of the motor is noted. Then is filled out the name of the customer, his address, the date, whether the work is to be a cash or charge transaction, and the make and model of the car. The blank also contains provision for entry where shipment of a motor, for instance, is made to the maker, this including the name and address of the consignee, the manner of shipment and the terms (whether the work is to be charged or paid for immediately), the model of the motor and the nature of the repair. There is a further record for the number of the cash sales sheet, if such be used, or the number of the invoice on which the charge is made. Below this is provision made for the detail of the repair, or the instruction.

The lower part of this blank is divided into halves, the right side of the sheet providing for charging the labor under the name or number of the workman by date and by hours, the left side providing for entry of the varying items of material requisitioned from stock or purchased and the amount charged for such parts or supplies.

The copy of the repair order is placed in a repair job envelope, which is of substantial paper, and on this is entered the job number, the name and address of the customer, the date, the number of the motor, the name of the car, the model of the car, with the general detail of instructions. This envelope is sent to the foreman and from this record is made by tagging the car or its components if disassembled. The envelope and this order are retained by the foreman.

In the course of the work on the job it is necessary to make requisition for stock and supplies. The workman makes application to the foreman, who fills out a requisition order blank which is given a serial number. On this is entered the number of pieces, the model of the car for which the stock is required, the name of the part or material and the price charged. Below this is entered the number of the job, the number of the motor of the car to be used on, the number of the cash sales sheet (if a cash transaction) or the name and address of the customer to whom the charge is to be made. This requisition is presented to the stock room and is honored, the articles being checked as delivered. This same requisition is used for all deliveries from stock, the repair order number being entered for a repair requisition, the purchaser's name and the cash sales sheet number if a cash sale, and the purchaser's name, to whom delivered and the invoice number if charged.

Repair Order.

Motor No. .... Order No. ....
Repairs for....................... Date ....
Address .... Terms ......
Shipped to....................... Via ....
Address .... Terms ......
Model .... Repairs Charge to.....
Cash sale sheet No. .... Invoice No. ....

Instructions for repairs.........................
....
....

Labor Number or Name	Date	Hours	Material	

Repair Order—Should Be Made in Triplicate, Original to Go to Customer If the Transaction Is Cash, Copies to Office and to Repair Job Envelope.

The requisition, which is made in duplicate, is filled out by the foreman and checked in the stock room. It is then divided, one part going back to the foreman and the other part is retained in the stock room as a voucher. The requisition copy is returned to the foreman and is placed in the envelope of the job with the repair order.

The workmen, whose time is recorded when they report for or leave their work, are required to keep their time for each job on which they are engaged. That this may be done systematically the time is noted on cards. On these cards are entered the name and number of the mechanic, the job number, motor number, date, the nature of the repair, and the number of hours engaged. These cards are small and are printed in series with perforation for convenient separation, the last ticket giving the name and number of the workman, the date and the total hours. The workmen are required to charge their time to the job number as soon as it is completed. The time card or cards of the workers engaged on the job are placed in the repair order envelope, and the time keeper receives the ticket that accounts for the total time of each man.

Repair Envelope.

Job No. ....

Repairs for ....

....

Motor No. ...... Date ....

Name of car .... Model ......

INSTRUCTIONS ....

....

....

Repair Envelope—Should Contain Repair Order, Copies of Stock Requisitions and Workmen's Time Tickets, the Whole to Be Filed on Completion of Work in Numerical Order.

When the character of the job necessitates a shipment of a part for repair or special work this is noted in the repair order by the foreman and the outside charge for this special work is entered in the order and later charged with the other items. The condition of the repair order indicates whether or not the outside work has been completed.

Assuming that the job has been completed the repair order envelope, with its repair order, requisitions and time cards, is returned to the office. From this copy of the repair order blank the other two copies are filled out. The one is kept with the requisitions and time cards in the repair order envelope, these envelopes being filed in numerical order for reference. The original is for the customer and is given to him as a voucher if the transaction is cash. If the bill is charged the original may be made a part of the transaction for a stated period, as for a month, while the other copy may be filed in a loose leaf binder or ledger and carried in this form as an account. If the relations are constant it is probable that there is a ledger account and the entries may be made as is customary.

Where the work is for the management it is essential that the labor and the stock or material be charged to an account covering a particular expense or expenses. For instance, should the job be an adjustment on a car sold, this would be charged to the car account and against the revenue from this particular machine. Every other item ought to be similarly noted and this will account for the time of every worker and the parts and supplies.

Requisition for Stock.

No. ....

No. Pcs.	Model	Name of part	Price	

For Job No. .... Motor No. ....

For ....

Cash Sheet No. ....

Charge to ....Inv. No. ...

Stock Requisition—If Parts Are Drawn from Stock for Use on Repair Order Enter Number of Repair Order; If for Cash Sale Enter Cash Sheet Number and Name of Purchaser; If to Be Charged Enter Purchaser's Name, to Whom Charged and Invoice Number.

For the stock room a receiving sheet is provided that is given a serial number and on this sheet is entered every article of stock that is received. This sheet indicates from whom the stock was received, the number of pieces, the model, the part number and the name of the part or material. From this the entries are checked in the stock ledger. Against the record all the parts supplied for requisitions are charged, the difference indicating the condition of the stock whenever comparison is desired.

The cash sale sheet is given a serial number and is dated. This carries the entry of the repair order number, the stock requisition number, the name of the customer, the name of the car and the amount. This is made in duplicate and it gives detail that cannot be usually found in the cash book.

Workman's Time Card.

Name .... No. ......

Job No. ...... Motor No. ...... Hours ......

Date .... Repaired ....

....

Name .... No. ......

Job No. ...... Motor No. ...... Hours ......

Date .... Repaired ....

Name ....

No. .... Total Hours ....

Date ....

Workmen must charge their time to job number as soon as work is completed.

Workman's Time Card—Print as Many Tickets, with Perforation for Separation, to a Card as Is Desirable. Last Ticket of Card to Go to Time Keeper.

Whether but one or several makes of cars be sold it is believed that the record of each individual car received is essential. Besides it is necessary to provide for certain transactions which do not represent actual transfers of money but must be regarded as having established value. This means that under the name of each make of car ledger accounts should be opened to car sales, parts sales, parts, and replacements and gratis repairs. Each account must be separate and distinct and show the number of cars received, the charges against each car, the price each car is sold for and the credits that reduce the revenue from each vehicle.

Mr. Burnell proposes a form of record that will average the profit or loss on the total number of cars sold during a given time rather than applying to each car, but comments that while the actual loss or gain on each car will not be indicated the data will be decidedly interesting. He points out that the car sales account, less the replacement account and plus the overhead charge will show the profit or loss on cars alone.

He suggests that a record sheet be made out that will be utilized for each car. This will have note of the name of the car, the model, the motor number, the date received, the date delivered to customer, the terms, the customer's name and address. This sheet is to be divided longitudinally and at the right side the general heading "Credit," and the general heading "Debit" at the left. Under these headings are divisions, the first "Debit" group including "Manufacturer's Price," "Freight" and "Extra Equipment;" the second group "Overhead" and "Parts Replacements;" the third "Repair Work (Gratis)," and under this "Job No.," "Labor" and "Material." Each group has abundant blank lines for additional entries.

Stock Room Receiving Sheet.

No. ....

Received from ....

....

No. Pcs.	Model	Part No.	Material

Stock Room Receiving Sheet—Check from This to the Stock Ledger. All Parts Sent from Stock to Be Checked from Stock Requisitions.

Opposite the first "Debit" group, under the "Credit" head, is space for entry of "Allowance by Manufacturer" items; opposite the second group is similar provision for "Allowed or Replaced by Manufacturer" entries, and opposite the third group may be entered "Allowances or Replacements by Manufacturer" which relate to repair work. It is pointed out that in making entries in this sheet the parts replacements "Debit" group may show but the requisition or invoice number, at total amount allowed, or the actual part replaced with the amount of allowance. Credited to the second and third groups are the manufacturer's credit memo number and the amount allowed.

Individual Car Record.

Name of car .... Model...... Motor No....

Date Received ...... Date Del'd to Customer ......

Terms ....

Customer's name..............................

Address ....

Dr.	Cr.
Mnfr's Price...........	All'd by Mfr...........
Freight	....
Extra Equipment........	....
....	All'd or replaced by Mfr.
....	....
....	....
....	....
....	....
Overhead	Allowances or replacements by Manufacturers
Parts replacement......	
Repair work (gratis)....	
Job No. .... Labor	....
Material	....
Job No. .... Labor	....
Material	....

Individual Car Record—Have Sufficient Space for Entries for Each Group and for Time Record. Parts Replacement Column May Show But the Requisition Invoice Number, the Total Amount Allowed, or the Actual Part Replaced with the Amount Allowed. The Credit Will Show the Manufacturers' Credit Memoranda Number and the Amount Allowed to Both Parts Replacements and Repair Work.

In charging overhead expense Mr. Burnell states that the total may be divided among the different cars or charged on the individual car record with reference to the number of cars handled for the month or the year. This would give an average revenue for a given period and it would not afford the precise information that would be possible were a separate account opened with each, but it would eliminate considerable itemized record. The precise value of the car record is in its accuracy and through this making it possible to effectually prevent the minor leaks. The large sources for shrinkage are generally well enough known and can be provided for to a greater or less extent, but it is with those which singly are trifling and collectively considerable that any system is created to cope.

Overhead expense is so differently regarded by different business men that it is necessary that it should be closely analyzed to include every charge that may be fixed. There are charges that are exceedingly variable, such as advertising, heating, lighting, water, repairs, etc., which must be averaged annually and apportioned with reference to each month on the basis of the corresponding month of the previous year, or estimated for the year and charged according to the estimate with a reserve or provision for emergency or extraordinary expense. The record of the dealings with the manufacturer and the customer relative to each car means that record must be continued after the sale of the machine has been consummated and indicates the actual profit on the service given in connection with each car so long as its owner desires to do business with the agent. This, however, is hardly a policy that can be approved, for work on the car ought to be regarded as repairing unless it comes within the guarantee of the manufacturer, for which attention the manufacturer ought to make reasonable allowance.

Cash Sale Sheet.

No. ....

Date ...., 1912

Repair Order No	Stock Requisition No.	Name	Amount	Name of Car

Cash Sales Sheet—The Data of This Sheet Will Be Charged to Stock and Credited to Car Account to Which It Relates.

The completeness of the repair department record cannot be too strongly advocated, as the possibility for loss through lost time and waste of material and supplies is much larger than is generally believed. In the accounting for time of the men the foreman or time keeper has a responsibility, while in the matter of stock and supplies this accountability ought to be placed entirely upon the stock keeper whose record must of necessity be thorough.

The accompanying forms, which have been suggested by Mr. Burnell, are in the main self explanatory. They may be adapted to the service of many garages, no matter what the proportions, and appear to be well suited to small establishments where the keeping of the records are combined with other duties. These may be modified to meet with requirements and among other advantages have the quality of adaptation without special preparation other than making inventory of the stock. In the matter of the individual car record and figuring overhead expense this would necessitate an accounting of the business for a reasonable period.

YOUR EXPERIENCE WITH YOUR BUSINESS.

What Will Yield Greatest Economy and Perfect Garage Service?

In our business of selling automobiles for the past six years we have always conducted a combination of selling, garaging and repairing. The only direct route to the profit account in the general automobile business is through selling a good car, having a good general at the head of the organization, and giving him able assistance and co-operation. Without these the foundation will be weak, and without a good foundation a business cannot prosper.

Our business was first conducted in a one-story structure, 60x125 feet, and we now occupy a three-story reinforced concrete building having 26,000 square feet floor space. The original working force varied from six to eight men, while today we have 34 on the pay roll. Where we originally stored six cars we have increased this service until we now have about 75 cars in storage. We only garage and repair cars which we sell, believing it is good business policy and a strong selling point to have only cars that we sell on display in the garage and to keep our cars in good repair. In other words we believe in giving the best of service to our customers and that we sell more cars, although the repair department shows a loss in itself, this loss being regarded as really a profit when its influence on the selling department is considered.

The employees who have been in our service for a year participate in the net profits, which policy makes it possible for us to attract and to retain the services of good men. We render detailed bills to the customers at the end of each month and all complaints are taken up and adjusted promptly. We find it best not to draw a line too closely where adjustments are necessary, and in many cases give the customer the benefit rather than have him displeased. It is wise not to establish a set rule in dealing with customers, but each should be dealt with individually, for a statement that might be as pleasing as sugar to the one man might be as vinegar to another.

We carry a very complete stock of parts for all our different models, but do not sell supplies save in a limited way, prices being cut on these to a surprising extent. Rather than meet these cut prices we prefer that this business should be done by others. When a customer comes to us and states that he can purchase certain articles at values less than we establish for them we tell him frankly that we would like to have his order, but under the circumstances we would prefer to have him buy where he can procure what he needs the cheapest. You will finally reap your reward, if not in furnishing the customer his supplies, at least in selling him and his friends more cars.

A. J. ZIMMERMAN.

St. Louis, Mo., Jan. 29, 1912.

The Minerva Motors Company, Antwerp, Belgium, is represented in the United States by F. W. Sewell, who has salesrooms at 1964 Broadway, New York City.

What Classes and Combinations of Cars Should a Dealer Sell?

I am decidedly of the opinion that it is best to handle more than one make of cars for several good reasons. This conclusion is reached after observation of examples of one-car agencies and those handling more than that number for a considerable period. I have no doubt that a number of the readers of this article will agree with me.

I know personally the experience of an agent who handled but one make of car who had the bad luck if you term it such, to be unable to secure cars from the manufacturer (I think a change was made in the construction to rectify a blunder in design) until very late in the season. Delivery was delayed so long that he was compelled to cancel many of his orders. This was his first season in business and as his capital was limited he was so discouraged that he retired and abandoned the agency.

I also personally know of another agent who handled several makes of cars. During one season his customers had so much trouble with one particular machine that he practically lost all his business with this line. Had he depended wholly on this agency he would have lost a great deal of money that season. Assuming that a man has the agency for a single car and the factory is destroyed by fire, as an illustration, when the demand for cars is at its height, he is deprived of his business for a time, at least, and perhaps badly crippled. Again, but not least, should an agent develop a profitable business with a car and the manufacturer decide to open a branch, this would practically deprive him of what he could justly regard as his possession.

My experience is that it is safest and most remunerative to have at least two agencies, the one for a car ranging in price from $850 to $1600 on one line, and the other for a car selling from $2000 to $4000. With these neither would conflict with the other. Should you have a bad season with one you would probably be able to show a profit with the other. With this plan you would be able to supply a car for a very broad class of trade. It might be possible to sell a low priced car to one man for business purposes, and a higher priced machine to the same man for family use. Expressed in the parlance of the street you would "get 'em going and coming." In the event that one of the lines did not come up to expectations it would be possible to abandon it and devote one's endeavors entirely to the profitable car until it was possible to replace the weak agency. In connection with this the proportion of selling and garage expense would not be as great with two lines as with one, and a good salesman would be as able to sell two classes of machines as but one.

A. J. ZIMMERMAN.

St. Louis, Mo., Jan. 31, 1912.

The United States Light and Heating Company has established a branch at 5 Irvington street, Boston, Mass.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from January Issue.)

THE Eisemann magneto group has been used with very complete battery systems, one of these being shown at Fig. 14 as applied to model 19 Peerless cars. These systems are separate and independent of each other, the battery group consisting of a four-unit coil, timer, source of current and set of spark plugs. The magneto system includes the generator, switch, transformer coil and set of spark plugs. The wiring arrangement is clearly shown in the diagram, but as this is a representative system, it will be well to explain the functions of the various parts and follow the circuits of both battery and magneto groups.

How Battery Ignition System Is Wired.

Following the circuits from the battery box with the aid of the diagram, we find one wire of cable connected to the battery post (painted red). This wire is carried to the coil where it is attached to the coil box terminal marked +. From M the terminal on the coil, a negative wire is attached to some part of the engine (as indicated at the point M). A return negative wire is fastened to the negative post of the battery (painted black) and leads to the post on the commutator shaft being doubly grounded on brass plate on cylinder 2. This forms a ground and completes the battery circuit for voltmeter.

The terminals on the coil box are connected through the switch to the four primary or low-tension windings of the four coils, which connect in turn through the upper terminals marked C1, C2, C3, C4, with each of the four brass terminal sleeves that are slotted |, ||, ||||, ||| to correspond with the upright terminal posts marked 1, 2, 4, 3 on the fibre base of the commutator. These four posts are connected with four copper contact segments that form a circular disc over which travels the contact brush that is connected through the upright shaft with a spring brush on the side of the commutator column, and also to the common ground wire on the side of cylinder 2. Two duplex cables are used in connecting the commutator to primary circuit of the coil.

Heavy insulated wire is used in the secondary circuit wiring from posts on the coil box marked B1, B2, B3, B4 to the rear end of the manifold wire bar (described later) terminals marked C1, C2, C3, C4. Thence from the wire bar through terminals marked C1, C2, C3, C4 to the spark plugs of the engine. The manifold wire bar is a solid rubber bar in which are encased the wires used for the transmission of the high-tension current used in both systems of ignition. This bar is plainly marked C for battery system and M for magneto system. This makes easy tracing of the current from the spark plugs of each cylinder through the entire system by means of the corresponding letter and number on the manifold bar.

The battery system is in circuit when the switch, located on the coil box, is thrown to the extreme left and the switch plug is in place, and is not in circuit when lever is thrown to the right. In the spark coil the making and breaking of the primary current by means of the vibrating tremblers at the top of each coil, sets up in the secondary coil, surrounding each primary coil, a highly intensified induced current. This secondary high-tension current flows from the four secondary terminals at the bottom of the spark coil marked B1, B2, B3, B4, to the spark plugs in each cylinder, where the current jumps the gap at the spark plug, creating a spark in the cylinder that ignites the successive charges of gas.

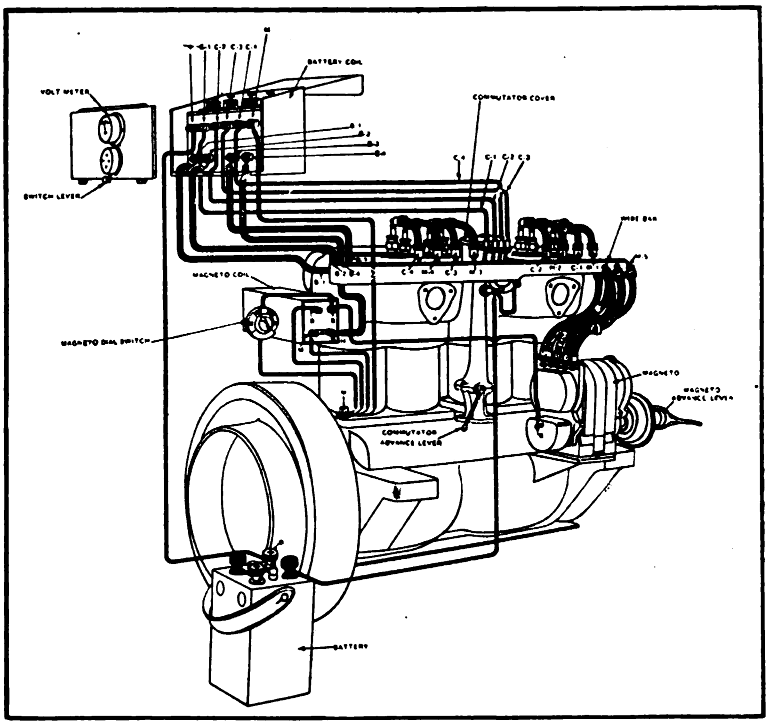

Fig. 14—Eisemann Magneto Group Main Element of Typical Double System.

One end of the secondary circuit is connected to the spark plug terminal, and the other to the primary wire which completes the circuit to the ground. This is common with the outer threaded shell of the plug when it is screwed into the cylinder. The time of the explosion in each cylinder is controlled by the time of contact of the revolving commutator brush with each of the copper commutator segments, which are connected through the agency of the posts 1, 2, 4, 3 and the wires with their respective cylinders.

Wiring of Magneto System Simple.

The primary wiring for the magneto system starts from the post marked B on the magneto and goes to the magneto coil terminal marked B on the right hand side of the magneto coil. From B (right hand) on the coil, a wire is run through the magneto dial switch to the common ground M. Wire from B (left hand side of magneto coil) to ground M. Wire from M on magneto coil to ground M. Wire from H to manifold wire bar (rear end) terminal marked 5 which is the high-tension distributing wire for the magneto.

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company. It will be continued through several numbers.

The secondary circuit for the magneto system consists of four heavy insulated wires with hard rubber terminals, connecting corresponding numbers on the magneto board to magneto numbers on the front end of the manifold wire bar. Also one wire 5 from magneto coil to 5 on magneto board through terminal marked 5 at front end of manifold bar. This secondary circuit of the magneto is carried to the spark plugs through the wire bar terminals M1, M2, M3, M4.

The magneto dial is located on the dash just to the left of the coil box within easy reach of the operator. This dial is marked A and M. When the indicator is placed on A there is a direct short circuit which causes the flow of current from the magneto to the frame of the car, thereby creating no secondary current to the spark plugs. When placed on M the circuit is open so that the current goes to the spark plugs after being transformed to a high-tension current in the magneto coil.

Features of Connecticut Magneto.

The Connecticut magneto is one that operates on the transformer coil system but is really a compromise type, designed by the maker to incorporate the advantages of both systems as much as possible. The details of construction are outlined at Fig. 15, and the design is simple and easily understood. In the low-tension instruments previously considered, the transformer coil has been a separate fixture, designed to be mounted on the dash or other part of the car, which involves the use of wires to provide for the passage of electricity from the magneto to the coil; these conductors are liable to deteriorate, especially if carelessly installed, and the consequent leakage of energy may reduce the efficiency of the instrument.

One of the arguments advanced by those favoring direct high-tension magnetos is that the wiring is simplified, all the necessary connections being made inside the device, only five wires being needed to connect a high-tension magneto to a four-cylinder engine. Of these four secondary leads run directly from the distributor to the plugs, the remaining wire including a switch in circuit by which the armature current may be grounded to stop the motor.

It will be apparent that the method of housing the transformer coil in the space between the magneto pole pieces or base assembly and the magnets utilizes space that is often lost, and makes it possible to have all primary and secondary connections in the instrument itself, except those leading to the switch or plugs, as in the high-tension form. The transformer coil is encased in a metal tube which is threaded in place, and as it is protected from injury or moisture, it is as much a part of the magneto as though wound on the armature.

In general construction, the Connecticut magneto follows conventional practise, inasmuch as the single wound armature revolves between the pole pieces energized by the permanent U magnets forming the field. The design permits of several refinements in construction, however, such as the simple connection between the revolving distributing brush and the secondary terminal of the coil. It will be seen that there is very little opportunity for loss of current in the conductor between the coil and distributor when this method of installing the transformer prevails.

Wiring Connecticut Dual System.

The Connecticut magneto may be used independently or in connection with a double system, and two types of instruments are made. The single form is intended for use with one set of plugs, and is a complete ignition system in itself; or it can be employed with a double system in which a battery and coil outfit furnishes current to an auxiliary set of plugs, forming a distinct unit. The dual type magneto combines two ignition devices in one, battery and magneto, using but one group of plugs.

The method of connecting the various parts is clearly shown in diagram Fig. 16. The advantage of this type is that the same magneto transformer coil is used to produce the spark, whether from the starting vibrator, the battery or the magneto. The same interruptor and distributor are used for the battery or magneto systems, and the only change in switching from the battery to magneto consists in the substitution of the electrical energy produced in the armature for that resulting from the dry cells.

The vibrator is resorted to only for the starting spark and it is so wired that it is only in operation when the starting button on the switch is pressed. After the button is released, ignition takes place from the battery, single sparks being supplied the plugs until the switch lever is moved to magneto position, at which time the battery is out of the circuit.

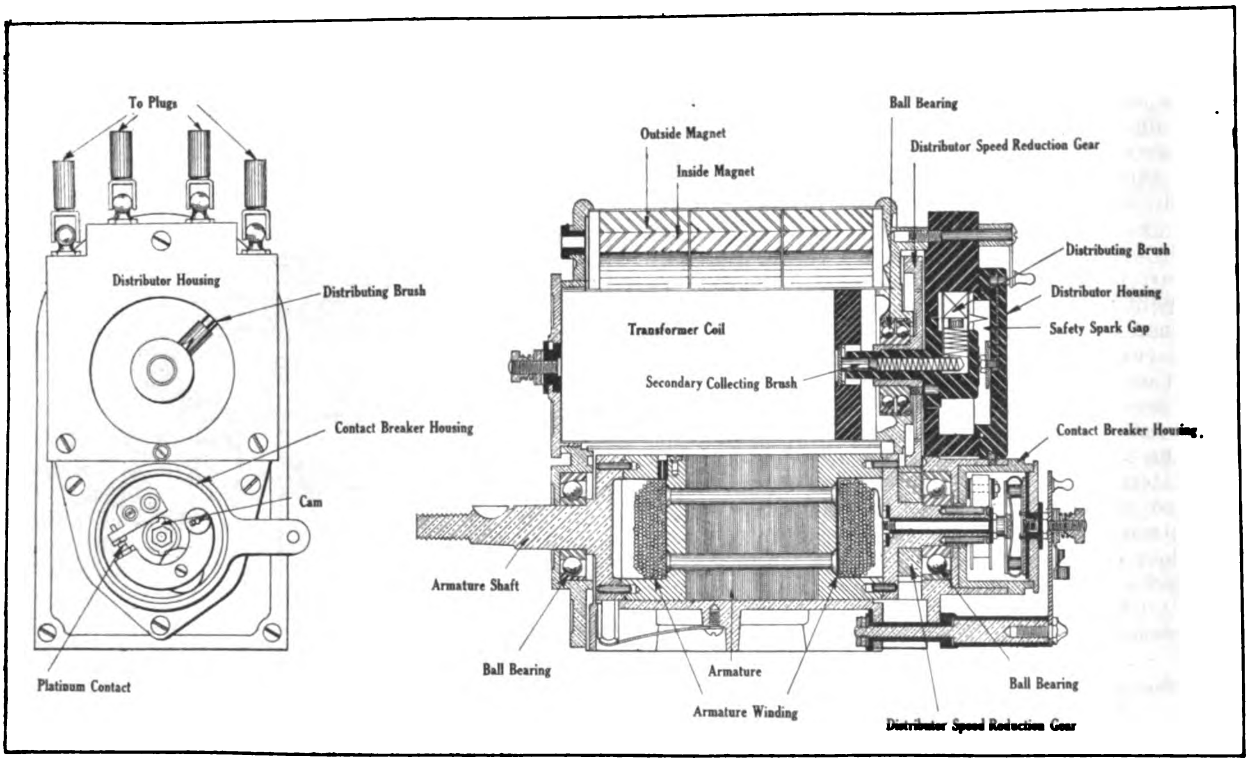


Fig. 15—End View and Longitudinal Section of Connecticut Magneto Clearly Depicts Excellence of Design.

The operation is as follows: The running or key plug, without which either system is inoperative, is inserted in the switch and the switch lever moved to battery position. The engine is now ready to start either by cranking in the usual way or on the spark by momentarily pressing the starting button in the centre of the switch. When the button is depressed the vibrator and primary of the transformer coil are coupled in series in such manner that the battery circuit is automatically made and broken many times during this depression, and a constant series of impulses is produced in the secondary coil of the transformer because of the fluctuations in core strength of the primary. This steady stream of high-tension sparks is supplied to the cylinder about to fire by the distributing brush of the magneto distributor, which is in contact with one of the segments leading to the plugs. These sparks are more powerful than the single one usually obtained from the plain coil, and ignition of the poorest mixture is assured. As soon as the engine starts the button is released, the battery current being interrupted by the magneto contact breaker and single sparks taking place in the cylinders.

How Vibrator Is Operated.

This may be better understood by referring to the diagram and tracing the wiring. The starting vibrator is a simple device that operates the same as the usual fitting of this character commonly installed on battery coils, except that the oscillating member or armature, as it is called, is actuated by a separate electro-magnet instead of by the magnetic flux of the transformer coil core, as is possible when it is mounted on the coil box.

We will assume that the switch lever has been placed on the battery position, that is, swung over to the right so that the movable switch contact is making a connection with the fixed point B, to which the negative pole N of the battery is connected by a wire. The spring in the switch operated by the push button is marked X and is normally in contact with the point Y of the switch. If the push button is depressed, the contact spring X makes contact with the point Z coupled to the insulated platinum tipped vibrator screw V. The contact points of the vibrator are normally in contact so that current can flow from V to W and thence to the ground, by passing around the winding and making a magnet of the core of the vibrator winding. From the ground, the current enters the primary coil through P 1, passes through it and energizes the core, at the same time producing a secondary or high-tension current in the secondary winding, and leaves the primary winding at P 2. This terminal is connected to the switch contact C, and the current passes to the switch plug, thence to the swinging lever of the switch which is in contact with fixed point B and back to the battery terminal N. The current leaves the battery from the carbon terminal or positive pole P and flows to the fixed switch terminal A, which in turn is connected with the button operated spring X.

Vibrator in Circuit with Primary Coil.

It will be evident that just as soon as the button is depressed and connection made between X and Z the vibrator winding is coupled in series with that of the transformer coil. This remains in circuit until the magnetism of the vibrator core pulls the armature W from contact with platinum tipped screw V, thus interrupting the current flow through the circuit represented by the wire leading from battery terminal P to switch terminal A, the spring X, the wire leading from Z to vibrator screw V, the winding of the vibrator, the ground to terminal P 1, the primary winding of the transformer coil, the wire leading from P 2 to switch terminal C, the short wire connecting the switch plug and switch lever, this lever itself, which is now supposed to be in contact with B, and the wire leading from B to battery terminal N. With each interruption of this circuit, there is an impulse in the secondary.

As soon as the circuit described above is interrupted by the separation of the vibrator points, assuming that the starting button is still depressed, the core in the vibrator winding loses its magnetism and the armature W is released again and again re-establishes the circuit, once more energizing the core causing another separation of the contact points V and W. The circuit is thus established and interrupted many times each second, and as there is a secondary impulse for each interruption it will be evident there is a constant succession of sparks at the plug as long as the starting button makes the contact between points X and Z of the switch.

How Battery Current Flows.

When the button is released, the spring X again makes contact with point Y and the vibrator is out of the circuit. The current flow is then through the wire leading from battery terminal P to A on switch, through spring X to contact Y and terminal D, from which a wire leads to the insulated contact breaker platinum tipped screw E. If the points are in contact, the current flows to contact lever F and from thence to the ground. From the ground the electricity passes to the transformer primary coil at connection P 1, thence through the primary winding to P 2. The remainder of the circuit to the battery is the same as when the starting button is depressed. When the contact breaker points separate, an impulse is produced in the transformer high-tension winding by induction and is commutated to the plug in the cylinder about to fire by the distributor brush. Only a single spark takes place, however, but this is so energetic there is no possibility of the charge failing to ignite.

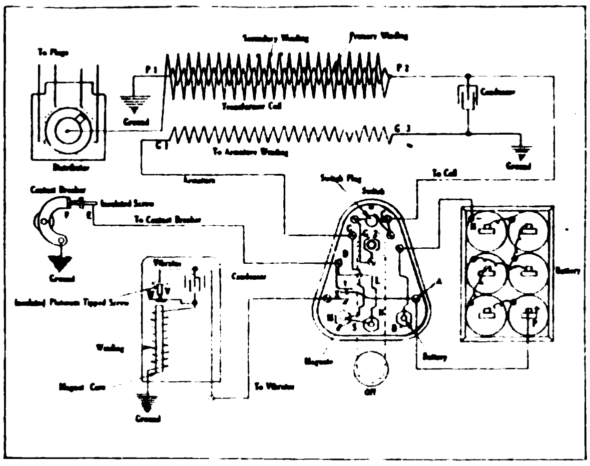


Fig. 16—Wiring Diagram, Connecticut Dual System.

Tracing the Magneto Armature Circuit.

When the switch lever is thrown to the left so it is in contact with fixed terminal M, the current produced in the magneto armature winding is utilized only when the contact breaker points separate. When these are together, any current existing in the armature winding is grounded directly through the switch and contact breaker. If the points are together, the circuit is represented by the wire leading from G 1, this corresponding to the insulated winding end to the terminal G in the switch, from thence to M, over the short conductor S (which bridges the terminals M and N only when the switch lever is in magneto position) to N, through the conductor L to terminal D, over the wire connecting D to E and to the ground by the lever F. From the ground to connection G 3. As no current flows through the primary of the induction coil, taking the shorter path through the closed contact breaker circuit by preference, there is no impulse in the secondary and no spark in the cylinder. Let us assume that the points are separated. The current in the armature, which reaches its greatest intensity when the points are apart is forced to take a longer path. This circuit may be traced as follows:

From insulated armature winding terminal G 1 to G in switch, over the wire joining G and M, from thence over the switch lever to G 2, to G through the switch plug, to primary coil terminal P 2, through the winding to P 1 and from thence to ground and over the ground to G 3. As soon as the contact breaker points make contact again (their circuit is interrupted only for a moment), the current from the magneto armature is again shortened and follows the shorter path that does not include the transformer coil winding. When the current flow through the transformer coil primary winding ceases, an impulse is produced in the secondary, an impulse also occurring as soon as the contact breaker points separate and the core is energized. It will be evident that every time the contact breaker points separate a spark will be produced in one of the cylinders, depending upon the position of the distributor brush.

Pfanstiehl Magneto Has Self-Contained Coil.

The arrangement of the parts of the Pfanstiehl magneto is clearly shown at Fig. 17. This is the type B for 1911, and delivers a high-tension current, is connected, this current leaving the magneto through the terminal B. The other end of the primary winding of the induction coil and a condenser terminal are brought together at A, and from there go to an insulated terminal on the magneto, being connected to B through the switch, so that the circuit can be intermittently grounded by the closing of the contact points on the cam operated rocker arm and insulated contact screw. The free end of the secondary winding of the transformer is brought to the secondary collecting brush, from which a short wire conveys the energy to the revolving distributing brush that contacts with the fixed segments in connection with the spark plugs in the engine cylinders.

The front elevation of the magneto is shown as well as the longitudinal section, in order to make clear the detail of the magneto contact breaker and the method of distributing the high-tension current through the distributor. Elevation shows cover F of the distributing chamber and plate G closing the contact breaker housing removed, these being held in position by the spring H, as outlined in the sketch.

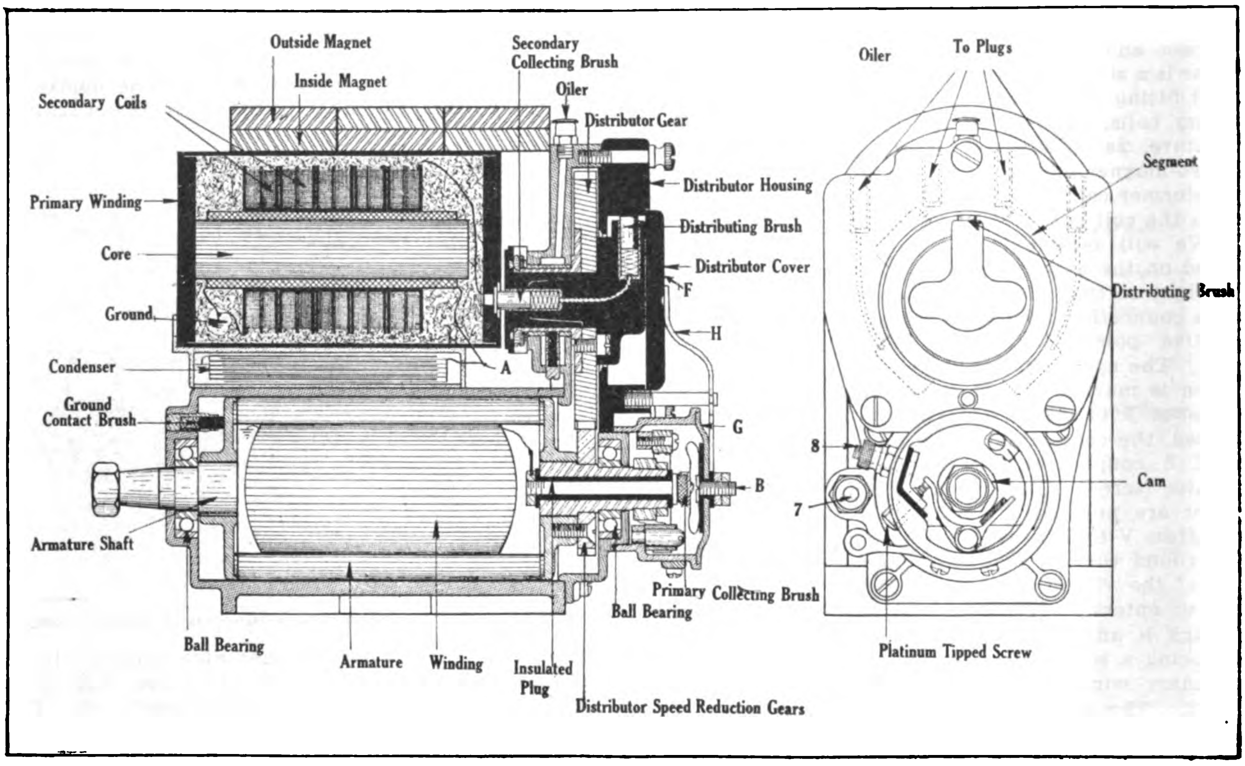


Fig. 17—Arrangement of Parts of Pfanstiehl Magneto with Self-Contained Transformer Coil.

though the secondary winding, in which the low voltage is "stepped up," is mounted in the transformer coil. This is placed under the arch of the magnets instead of on the dash or on the armature, and in this respect the design is similar to that of the instrument previously described. The grouping of the parts is easily followed, as these are plainly indicated in sketch.

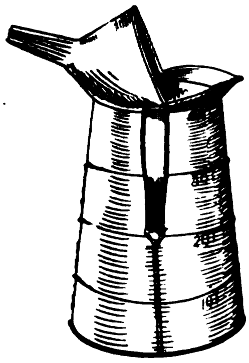
Referring to the longitudinal section, it will be evident that the magnetic field in which the armature revolves is produced by three pairs of U magnets, as in most conventional designs. The armature is an ordinary H or shuttle type and has a single winding of comparatively coarse wire, producing a current having considerable amperage but low voltage, and revolves on annular ball bearings. One end of the armature winding, one terminal of the condenser, one of the ends of the transformer coil primary, and one of the ends of the transformer secondary winding are grounded. The other end of the armature winding is attached to the insulated plug at the contact breaker end of the armature shaft to which the primary collecting brush in the contact breaker cover

The construction of the transformer coil used to "step up" the current of low voltage can be learned from longitudinal section. This consists of a core composed of a bundle of soft iron wire around which is wound a primary of coarse wire, usually about No. 16 or 18 standard wire gauge. The secondary winding is of finer wire, this varying from No. 36 to 40. In the Pfanstiehl transformer the secondary is a number of thin coils, each being separately insulated by being wound on its own bobbin or spool of insulating material. This construction makes for better insulation and reduces the liability of breakdown in the windings, such as sometimes occurs in transformers having a continuous winding. This assembly is placed in its containing case of insulating material and is surrounded by hard composition, which has been poured in while fluid so that every interstice in the windings is properly saturated. Obviously, the parts will be held firmly together when the material has become set.

(To Be Continued.)

ACCESSORIES AND APPLIANCES THAT SELL.

The Dover Duplex Funnel is a new addition to the line produced by the Dover Stamping & Manufacturing Company, Cambridge, Mass. It is a combination measure and funnel and is fitted with a pouring lip with a centre channel, an appreciable feature when fast pouring is desired. For filling oilers or vessels having small openings a funnel is provided on the opposite side and the spout extends upward so that when the measure is set down the oil runs back into it instead of dripping outside. The handle is located on the side, facilitating work when the device is being operated in close quarters or cramped places. In addition the measure is graduated, each being marked, and these comprise pints and quarts. The line is manufactured of extra heavy material, copper plated, lacquered, and all seams are soldered and guaranteed not to leak. They are made in sizes ranging from one-half pint to four quarts capacity.



Dover Duplex Measure

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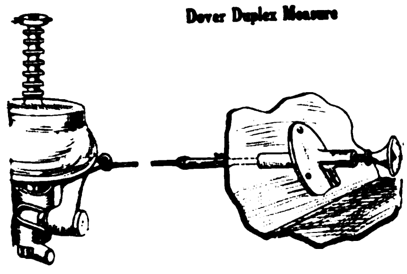
The Stromberg Dash Adjustment is the product of the Stromberg Motor Devices Company, Chicago, maker of the well known carburetor of that name, and is designed to be utilized in connection with the vaporizer. To obtain the best results from a carburetor the mixture should be perfect, and although adjustment may be made with the motor running idle, it is more advantageous to set the device when the engine is working under ordinary conditions. This usually requires two men, one to operate the car while the other adjusts the carburetor. The Stromberg appliance, which is made in several forms, is attached to the dash and is equipped with a plunger rod which extends to the vaporizer. By turning a knurled member the mixture may be varied throughout, an appreciable feature where atmospheric and other conditions prevail.

Dover Duplex Measure



Stromberg Air Adjuster

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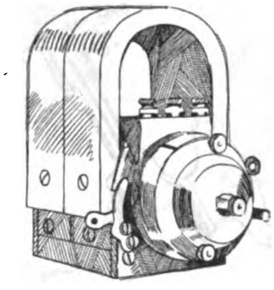
The No-Lag Magneto, manufactured and marketed by the American Circular Loom Company, Aldene, Union County, N. J., is of the low-tension type and two alternating waves of current are generated in the armature at each revolution. One of these waves is interrupted by one pair of contact points of the circuit breaker, and the other by another similar pair of points located directly opposite on the other side. The low-tension current is built up by two transformers, compactly arranged, by which it is claimed that the efficiency is increased greatly, and that the spark occurs in the cylinder at the same instant that the break takes place at the contact points of the circuit breaker. It is also claimed that wear is reduced and that by placing the condensers directly over and very near the circuit breaker, burning and pitting of the platinum points is eliminated. Instead of distributing a high-tension current to each plug and returning through a ground, two spark plugs are placed in a series circuit, producing a spark in two cylinders, timed to take place, in one, at the end of the compression stroke, and in the other, at the end of the exhaust. The spark in the latter cleans the points of the plug and intensifies the spark in the cylinder on compression.



No-Lag Magneto

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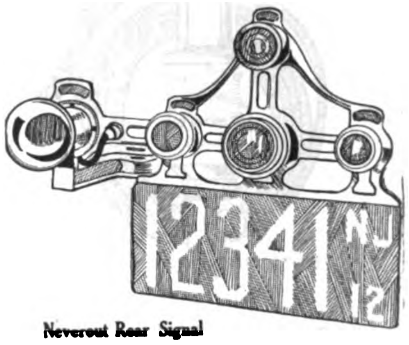
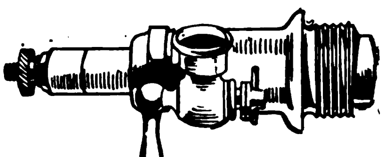
The Neverout Rear Signal Bracket is a combined rear lamp, license bracket and signalling device produced and marketed by the Rose Manufacturing Company, Philadelphia, it being patented in this country and abroad. It is operated by electricity and a push button switch is placed in an accessible position. This is equipped with three buttons for lighting the desired signalling lamps. The latter are four in number. A red disc is fitted to the middle of the bracket, this light burning constantly during the night and serving as the usual tail light. This is provided with a slot which allows a white light to be thrown upon the number plate attached immediately below. On either side of the red lamp is a white disc, these being employed for signalling to a vehicle in the rear that the operator of the machine in front is about to turn to the right or left as the case may be. Above the tail light disc is a similar member which shows a green light, this being utilized to warn those in the rear that the automobile is about to be stopped. Attached to the device is an electric horn which is sounded each time the white or green lights are operated, or flashed. The buttons on the switch are so arranged that a mistake cannot be made in signalling as the right hand member operates one white light at the rear, the left button the other, and the centre, the green.



Neverout Rear Signal

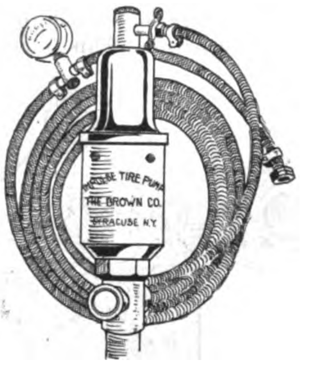
—— ★ ——

All-In-One Spark Plugs, marketed by the Frontier Specialty Company, Buffalo, N. Y., are manfactured in six different types to meet the requirements of varying motor designs. The construction eliminates the removal of a spark plug for priming purposes as a priming cup is incorporated, a feature which will interest motorists whose engines are not fitted with such a component.



All-in-One Spark Plug

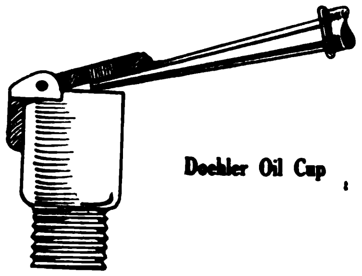
The Brown Impulse Tire Pump is a device which will appeal to motorists as by it a large tire may be inflated quickly and without exertion upon the part of the operator. It is compact and may be stored in the automobile easily and is said to be free from complications and noise. The instrument is fitted with a special breather valve providing means for drawing in and conveying cool, fresh air to the tire, and in addition, it is equipped with a pressure gauge which automatically indicates the amount of air in the shoe. This arrangement dispenses with the usual device and its operation. To attach the pump, any convenient spark plug is removed and the former screwed in by hand until fairly tight. The motor is then started and run very slowly as the pump will deliver its full efficiency under this condition. The air hose is attached to the tire and the pressure gauge watched until the required amount is indicated. The length of the tubing is sufficient to reach every wheel. When more than one shoe is to be inflated it is not necessary to stop the motor. The pump is manufactured by the Brown Company, Syracuse, N. Y.


IMPULSE TIRE PUMP
THE BROWN CO.
SYRACUSE N.Y.

Brown Impulse Tire Pump

★

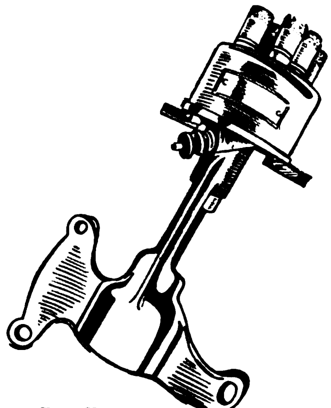
The Doehler Oil Cup is a lubricating device manufactured and marketed by the Doehler Die Casting Company, Court and Ninth streets, Brooklyn, N. Y., and a feature is that it may be attached easily by means of a screw driver. The oiler is fitted with a spring retained lid which closes on the outside of the container, this arrangement, it is said, facilitating the flow of the lubricant to the bearing. The cup may be filled easily, the operation involving the use of but one hand, as the nozzle of the oil can is inserted readily.



Doehler Oil Cup

★

The Atwater Kent Unisparker is a device brought out by the Atwater Kent Manufacturing Works of Philadelphia for model T Ford cars and consists of a bracket and gears operating its well known system of ignition. For it is claimed large mileage with small current consumption, that synchronism is obtained and that once adjusted it does not require any attention. It may be installed easily without the use of special tools or machine work, by anyone who knows how to time a motor. The device is gear driven from the timer shaft, a pinion being attached to the latter after removing the usual commutator. By drilling two small holes in the gear-case cover the bracket is readily attached and this arrangement permits of quick removal of the member for inspection. Although the device is designed particularly for Ford cars special sets of gears and brackets are manufactured for several other makes.



Atwater-Kent Unisparker

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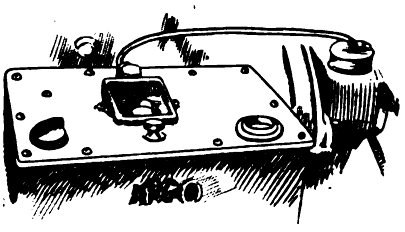
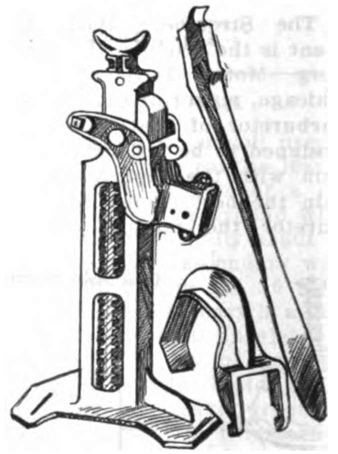
The Apco Force Feed Oiler is marketed by the Auto Parts Company, Providence, R. I., and is made especially for this concern by the Detroit Lubricator Company, Detroit, and is designed for model T Ford cars. It is fitted easily to the right hand side of the motor and it is claimed that it may be installed in less than an hour. The oil is fed into the breather pipe by means of a small tube, the latter passing through a small opening in the screen of the breather member. The mechanism of the oiler consists of a double plunger pump which pumps the oil from the reservoir through the sight feed nozzle, from which it drops, and the other plunger takes the lubricant from the sight feed chamber and forces it to the breather. Drive is by a steel belt from a pulley attached to the camshaft, the former replacing the retaining nut of the timer brush. The amount of oil fed is regulated by turning a button in front of the sight feed, this permitting of a fine adjustment.



Apco Oiler

★

The Peerless Jack of the 1912 design, presents interesting features, inasmuch as the device may be used to remove stubborn tires as well as raise a wheel of the automobile. Believing that there is a demand for a light jack of compact size but strong enough to stand the strain of heavy work, the Oliver Manufacturing Company of 326 South Desplaines street, Chicago, brought out the new model, which is fitted with a large arched base to prevent tipping and provided with means for increasing its leverage and simplifying its lowering arrangement. It is said that it will work well in any position and that it is lowered easily by turning the handle. One of its features is a bracket which when attached to the jack and placed between the spokes of a wheel, will push or pull upon a tire, as desired. The handle is so constructed that it forms a handy tire tool. It weighs four pounds and is about eight inches in height.



Peerless Jack

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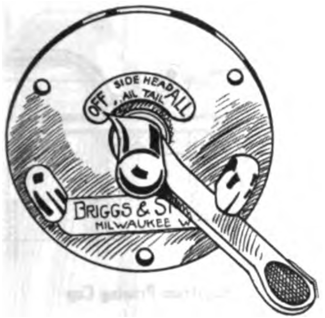
The Briggs & Stratton Lighting Switch has been brought out by the Briggs & Stratton Company, Milwaukee, Wis., to meet the demand for a high grade switch for automobiles fitted with electric lighting. It is a four point switch of the kick type and the moving

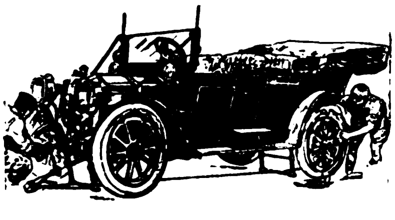


Briggs & Stratton Switch

of the lever provides for lighting the side and tail lamps, the headlights, all five, and an off position. Any one of the groups may be utilized singly or in conjunction with others. The device is finished in either brass or nickel, polished or frosted, is compact and very attractive in appearance.

* * *

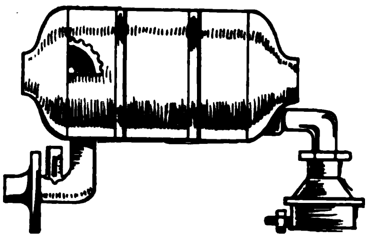
The Four-Wheel Auto-Jack and tire saver is a device for raising the entire car from the floor of the garage or ground and the operation is so simple that it is said a child can lift the heaviest automobile in less than a minute. The jack consists of two rectangular steel frames which lean against the axles of the machine at an angle. The frame bases are connected by a chain which also is attached to a powerful differential jack screw. When the latter is operated the tilted frames are drawn together which movement pushes the car backward and at the same time raises it. The device is operated easily, being laid upon the floor and the machine driven over it and stopping within a foot or so of the correct position. The rear jack is then placed under the rear axle and the front member attached. The differential lever is then turned and the machine is not only blocked securely but raised two or more inches. The chain is adjustable and the device will fit any motor car. To demount, the jack is compressed, this requiring but a few seconds. The advantages of a tool of this type are numerous, among which may be mentioned that it removes the weight of the car from the tires, increasing their service, prevents contact with oil drippings and dampness; permits of drying the shoes after being exposed to the rain and washing; allows a daily examination for cuts; facilitates the application of tire chains, adjusting brakes and mechanism, and washing. The Four-Wheel auto-jack, for which John E. Nattress, 3132 Columbia avenue, Philadelphia, is agent, is guaranteed to lift safely a load of 6000 pounds.



Four-Wheel Auto-Jack

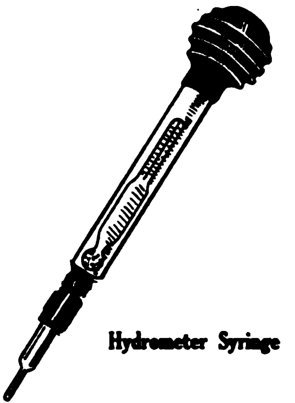
* * *

The Kerosene Gas Producer is an attachment invented by William K. Bassford, a mechanical engineer and authority on internal combustion engines, and designed for use in connection with any type of automobile, marine or stationary engine, whereby the less highly refined non-explosive fuels, such as kerosene or denatured alcohol, may be utilized instead of gasoline. The device is cylindrical in shape, about six inches in diameter, its length varying according to the horsepower of the motor, and is attached in the same manner as a muffler. It is produced in the form of an exhaust manifold when it becomes an integral part of the engine, thus permitting the use of gasoline or kerosene. In this type the control is automatic, and it is claimed that it does not require any attention upon the part of the operator. The motor is started in the usual manner, and after running for about three minutes, the kerosene is turned on and gasoline shut off, this being performed automatically by means of a thermostat, which also regulates the temperature of the gas entering the cylinders. But a small quantity of gasoline is required, this being contained in a priming tank holding about one gallon. It is pointed out by the maker that the device utilizes all of the heat units and that the low price of kerosene reduces the operating cost to about one-half of that when gasoline is employed. The gas producer is not only adapted to motor cars, but to large plants. It is manufactured by the Universal Oil Converter Company, Long Island City, N. Y., for which the Kerosene Gas Producer Company of New York City is agent.



Kerosene Gas Producer

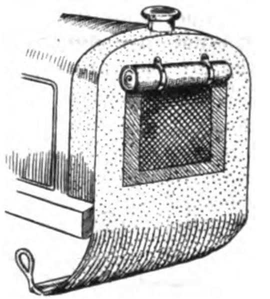
A Hydrometer Syringe that will appeal to motorists who charge their storage batteries as well as those who test the acid of the members, is marketed by E. Edelmann & Co., 49 West Kinzie street, Chicago. The device is a combination acid syringe and hydrometer, the latter being contained in the instrument and its action is said to be very accurate. This arrangement is an improvement over the usual apparatus which consists of a jar and a hydrometer. The syringe is neat and compact and may be carried easily in the motor car.



Hydrometer Syringe

* * *

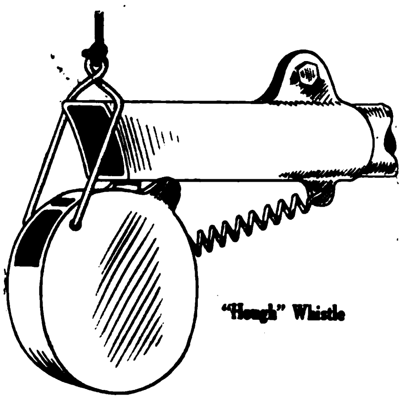
The Gordon Radiator Robe, manufactured and marketed by the Vehicle Apron & Hood Company of Columbus, O., is designed for covering the front of a radiator and protecting the contents from freezing. It is constructed of heavy, artificial leather and lined with wool, and attached to the cooler by means of straps. In addition, it is provided with a curtain which may be rolled up when the car is being operated, and lowered and fastened when the machine is standing idle. It is made in three sizes, large, small and medium.



Gordon Hood Cover

* * *

The Hough Whistle is a new type of warning signal designed especially for model T Ford automobiles and was invented by a motorist in Providence, R. I. It proved so successful in practise that the rights to manufacture the device were acquired by the Auto Improvements Company of Bristol, R. I. It is attached easily and quickly to the end of the exhaust leading from the muffler by means of a tapered tube which is split at one end and locked by a threaded bolt and nut. The other end of this part is square and slightly concave so as to fit over and partially close the opening in the drum-shaped member. The latter is attached to the part on the exhaust pipe by two hinged extensions and a spring is fitted to keep the drum from moving upward except when the signal is desired. A link is connected to the drum and the former serves a double purpose, inasmuch as the wire leading to the operating pedal is attached to this link which also checks the downward movement of the drum. When the latter is in a neutral position, the flow of burnt gases is not obstructed as they pass freely over the drum, which is made of aluminum. The tone of the whistle is mellow and far reaching in its effect. The device is moderately priced.


"Hough" Whistle

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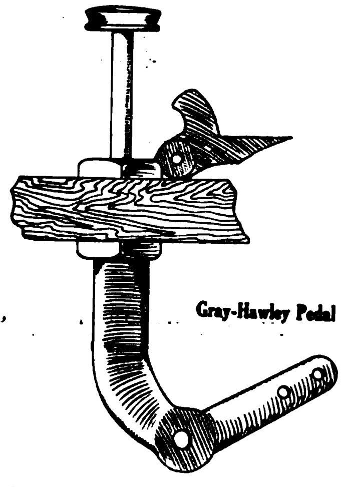
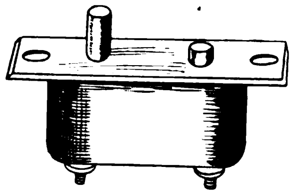
The Gray-Hawley Pedal, manufactured by the Gray-Hawley Manufacturing Company, Detroit, well known maker of motor car accessories, is an adjustable device for operating the cut-out of the exhaust or signals and is actuated by the pressure of the foot. The appliance is fitted easily by boring a .75-inch hole in the footboard, through which opening the threaded part of the member is passed and its upper end locked by a nut. The length of the part is such that different adjustments are possible by making use of the lower locking nut. The plunger rod which carries a flat head, moves easily through the stationary part and actuates a V shaped lever which is provided with two holes for the purpose of attaching the cable. The upper locking nut is fitted with a pawl member which engages with a recess in the head of the plunger when the latter is depressed. This permits locking of the pedal which is released easily by touching the member with the foot. The device is constructed of the best grade malleable iron and polished brass. It is inexpensive and may be purchased without the locking attachment.


Gray-Hawley Pedal

★

Push Button Switches of the flush type are utilized in fitting electrical devices to the automobile with a limousine body, and a neat appliance of this kind is manufactured and marketed by Frank W. Morse, Boston. These are made with polished brass, nickel, old brass, gun metal and Bauer Barff finish, and are provided with interchangeable plates. The appliance is manufactured with single, two, three or four gangs.


Push Button Switch

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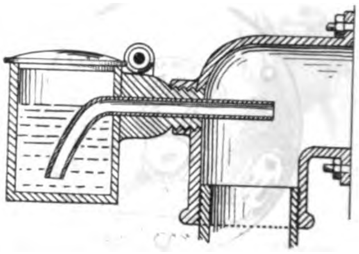
Wolf Head oil and greases, manufactured by the Wolverine Lubricants Company, 80 Broad street, New York City, include in addition to the regular lubricating fluids, Crystal oils which are utilized by aviators and owners of high priced motor cars and racing boats who desire an oil which, regardless of cost, will be entirely free from all carbon producing impurities. It is a pure Pennsylvania product which is filtered and refiltered until it is crystal clear; is of high gravity and flash point, and is made in light, medium and heavy grades. The company also produces a high grade of cylinder oil adapted to high speed motorcycles, as well as marine and gear lubricants. All cans and barrels are sealed when they leave the factory so that they reach the consumer in their original condition. The company also manufactures a non-flowing oil for transmissions and gears, which is recommended in preference to grease and graphite for use in cups, universal joints, etc.

The Hagstrom Priming Cup is a departure from the ordinary form inasmuch as it is automatic in its operation. It consists of a brass vessel which is attached to the intake manifold or pipe by drilling and tapping a hole. The device for holding the gasoline is fitted with a hinged cover. To utilize the primer, fuel is poured into the cup and the lid closed. The maker, Hagstrom Bros. Manufacturing Company, Lindsborg, Kan., claims that one turn of the starting crank will start the motor. A tube leads from the vessel into the intake pipe and the gasoline is drawn into the manifold by the suction of the piston on the intake stroke, and at the same time, it is said to convert the liquid into a vapor. Auxiliary air is prevented from being drawn in when the cup is empty by the lid which is machined to a perfect fit and held securely on its seat. The device contains enough fuel to operate the motor for some little time. In addition it is said that the primer may be utilized as a decarbonizer injector.


Hagstrom Priming Cup

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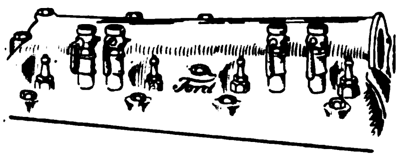
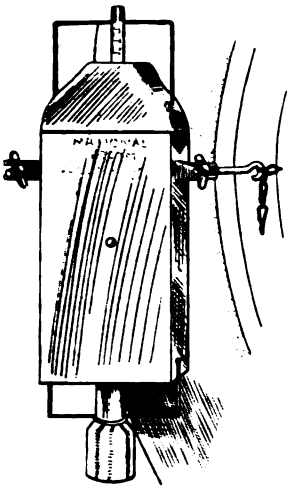
The Ford T Help Starter is a priming device fitted by the Home Light Company, Chicago, which concern is specially equipped for attaching priming cups to this type of motor car. In very cold weather when it is necessary to inject gasoline into the combustion chamber before the motor can be started, the spark plugs have to be removed if the engine be not fitted with priming cups. The Ford T is not equipped with these devices, and the construction of the cylinder head, which is one piece, is such that extreme care is essential in boring this part. The company guarantees a gas and water tight job which necessitates the sending of the cylinder head to its plant.



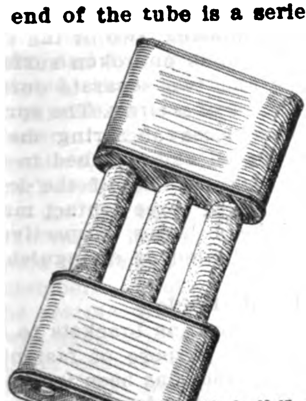
Ford Help Starter

The National Steam Vulcanizer is a handy vulcanizing outfit that may be carried in the tool kit of a motor car and is manufactured by the National Motor Supply Company, Cleveland, O. It is operated by steam which is favored in this work, and which is said to eliminate the danger of burning the rubber. The device is a hollow brass shell which is partially filled with water, and the fluid is heated by a wood alcohol lamp. It is adaptable to any sized tube or casing, requires but a few minutes to generate steam, and is fitted with a thermometer. It may be operated with the tire on the wheel.


National Steam Vulcanizer

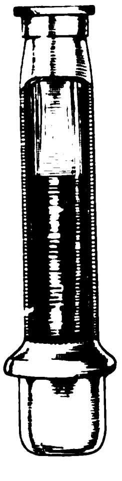
* * *

The Mondex Muffler presents interesting features inasmuch as it it claimed that it is self-cleaning, prevents back pressure and is compact and light in weight. It comprises three pipes of seamless tubing, connecting two expansion chambers, and the two outside members, which run its entire length, are spanned over the heads at each end. The exhaust enters through the first tube and travels throughout the muffler. At one end of the tube is a series of perforations, the sum total of these being three times the diameter of the pipe. Passing through these openings, the gas enters the first expansion chamber, then through the centre tube to the second chamber, after which it expands through perforations in the third tube and a tail pipe into the open air. As the two chambers are exposed to the air, cooling is facilitated. The device is free from bolts, nuts, cups or baffle plates, the chambers being held together by steel bands shrunk into position. Inside the outer casings of the chamber is a layer of asbestos, which is encased with galvanized iron. It is made by the Aristos Company, New York City.


Mondex Muffler

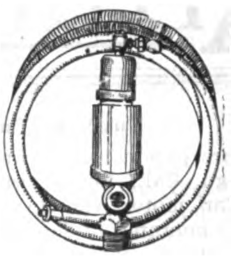
* * *

The Vanometer is a new form of a fuel gauge fitted to the dash where the operator may note at a glance the amount of liquid in the tank, and is manufactured by the Van Auken Indicator Company of 123 Liberty street, New York City. The device is operated by liquid balance and is connected to the tank by a tube. A coil of copper tubing, which is adjustable, is inverted in the top of the container and extends to the bottom. The fluid in the Vanometer, which is .5 inch wide and 3.5 inches high, is red, being a special chemical compound of certain specific gravity and will withstand a temperature of 20 degrees below zero, Fahrenheit. The tube connecting the indicator and tank contains air which rises and falls according to the amount of gasoline in the latter. This raises or lowers the colored fluid, and it is claimed that its registration is not affected by grades. It is attached easily, and having no mechanism to get out of order, is durable.


Vanometer

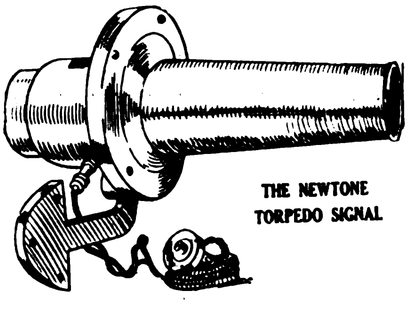
* * *

The Spark Plug Pump, marketed by the Mayo Manufacturing Company, Chicago, is a new form of tire inflator which is operated by the motor. It is attached easily and quickly by removing a spark plug and inserting the member and it is claimed the operation may be performed with the hands. The pump is on the compound principle and utilizes pure air supplied by an intake valve and compounded to high pressure into the upper cylinder of the member and thence forced to the tire. When in use the engine is run at a low rate of speed, and it is said that a shoe may be inflated to 150 pounds pressure in a few minutes. All working parts are substantial and the piston is fitted with rings. Interchangeable connections make it adaptable for different sized spark plug openings.


Spark Plug Tire Pump

* * *

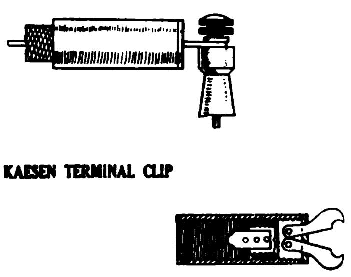
The Newtone Torpedo is a new signalling horn produced and marketed by the Automobile Supply Manufacturing Company of Brooklyn, N. Y., and the design is such as to add to the attractiveness of the car. It is operated by a new electric motor brought out by this company. The fields of the motor are made up of 75 thin discs of special steel thoroughly insulated and its construction produces more power with less current consumption. The motor actuates a rust proof diaphragm and the device does not require oiling, or sound adjustments, and its warning note is powerful and far reaching in its effect. The shaft of the motor runs on imported ball bearings which require no attention whatever and its easy running qualities with the construction of the steel laminated fields, lengthen the life of the battery. The device is constructed of the best materials and the workmanship is first class in every particular. It comes complete, including bracket for attachment, press button switch and ample length of flexible cord. The company also markets two other models, one of which is adapted to small vehicles.

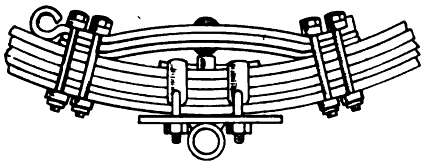

THE NEWTONE TORPEDO SIGNAL

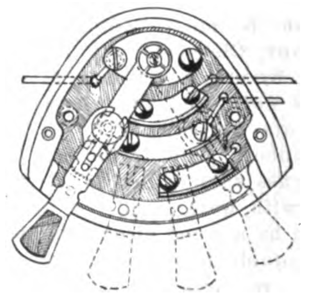
RECENT PATENTS of INTEREST

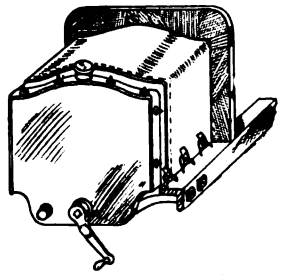
Auxiliary Fuel Supply.

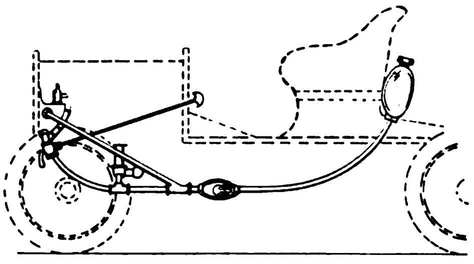
Letters patent have been issued Edward C. Smith, San Diego, Cal., for a gravity feed emergency fuel device for motor vehicle. It comprises a gasoline container mounted under the hood and near the radiator, and of peculiar shape, being flat on one side and curving to a point at the lowest end. A pipe is led from the vessel to the carburetor and interposed in the line is a stop cock which is operated by means of a rod extending upward and through the dash to a position convenient to the operator. Another pipe leads from the upper portion of the auxiliary tank to the main supply line and is connected thereto. The pipe leading to the extra vessel is fitted with a check valve its object being to allow the fuel to flow from the regular tank by gravity to the auxiliary member, but not back into the former. The small container is automatically filled by gravity as the main member is considerably higher and the fluid flows through the usual channels to the extension and thence to the emergency vessel. Here it is held by the stop cock until required. The auxiliary tank is fitted with a safety valve also a wall with air spaces to protect its contents from the heat of the motor, as well as to provide a circulation of air. It is claimed of the device that in addition to providing emergency fuel a flow of gasoline may be furnished to the carburetor with the car operating on unusually steep grades.

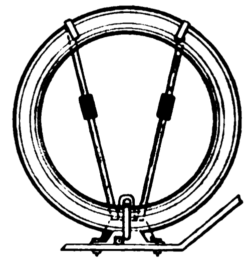

KAESEN TERMINAL CLIP


EMERGENCY SPRING DEVICE


MULTIPLE LIGHT SWITCH


BULLOCK HOOD AND RADIATOR COVER


EMERGENCY FUEL DEVICE


CAMPBELL TIRE HOLDER

Some Patents Applicable to the Motor Car and of Interest to Owner, Maker and Manufacturer of Parts.

Emergency Spring Device.

Broken springs are not uncommon and among the devices intended to make a temporary repair is the invention of George S. Spreyer, Canon City, Col., to whom a patent has been issued. It differs from the usual construction of these appliances inasmuch as the leaves of the springs are riveted together at the centre, although the members bear loosely upon one another. The ends of the springs are so spaced apart that when clamped together they form a resilient spring end. An upturned extension is provided at one extremity while that of the opposite end is equipped with an eye and means are adapted to bear on the upturned extension and pass through the eye for securing the ends of the auxiliary spring on opposite sides of the line of cleavage in the vehicle spring.

Multiple Electric Switch.

A patent has been granted to Edward E. Taylor and David H. Elkins, Amesbury, Mass., assignors to William Gray of the same place, for a multiple electric switch for lighting purposes. The device is similar in construction to the usual ignition members, being fitted with a throw lever which is pivotally mounted but so arranged that three movements are provided from right to left in operation. The first lights the side and tail lamps; the second, the head and tail members, and the third, all five lamps, this arrangement providing means for lighting the different members at the will of the operator. This is accomplished by means of three separate insulated contact pieces within the switch housing, two of the contact members having a continuous unbroken surface, while the third has a base and two separate curved surfaces located in the same arc of a circle. The spring lever is fitted with contact pieces of spring metal. The wire from the battery is led and attached to the terminal forming the retaining member of the lever and a single lead from each of the three contact members to the tail, side and head lamps, respectively, any group of which may be lighted or extinguished, as previously outlined.

Tire and Trunk Holder.

Many motorists object to attaching brackets to the body of the motor car for the purpose of fastening the extra tire and trunk. A patent has been issued to Archibald U. Campbell, Toledo, O., for a combined tire and trunk holder which obviates the use of body attachments, and in addition is adjustable permitting the retention of different sized shoes, a feature which will appeal to motorists when exchanging their machine for one equipped with larger or smaller tires. The locking device consists of a base block which is attached to the running board and provided with a movable lug which rises from the inner side and extends outwardly and downwardly over the tire, and means are provided for locking the bar to the base member in the usual manner. Two telescoping arms are attached at one end to the base block extending upwards, and are provided with curved ends for the purpose of securing the shoe. The design is such that a tire cannot be removed by forcing it away from the upper supports as the lower part of the shoe is held securely by the locked lug. In addition it is claimed that a tire may be removed or replaced in a few seconds as there are no straps to unbuckle, the operation involving merely unlocking the lug.

Electric Wire Terminal.

A device for the purpose of connecting electric conductors with spark plugs in internal combustion engines, although the appliance is not limited to spark plugs in its scope, has been patented by Julius Kaesen of New York City. It is claimed that by it a connection may be made quickly and securely to the central electrode of a spark plug or binding post of any telegraph or electrical instrument, and that its construction is such that it cannot work loose. It comprises an internally screw threaded sleeve and an externally screw threaded member is said sleeve with its threads in engagement with the former, also a fastener at the inner end of said body for the conductor. A pair of jaws are pivotally mounted to the inner member. In attaching the device the outer sleeve is unscrewed and moves backward allowing the jaws to expand. To fasten the latter, the sleeve is rotated in an opposite direction, which movement closes the jaws firmly upon the electrode or binding post as the case may be. The device for attaching the wire consists of a strip riveted to one side of the inner member and extending beyond is bent over and doubled upon itself to produce, with a screw, the fastener proper.

Hood and Radiator Covering.

A covering for the radiator and hood of a water-cooled motor car, the design of which is such that one or both parts may be protected from the cold or elements, has been invented by Calvin Bullock of Denver, Col., to whom a patent has been granted. It comprises three parts; namely, a body member for covering the hood, a relatively narrow strip for the top and sides of the cooler, and a third or cap member for the exposed end of the radiator. The third member is designed for use in cold weather and is fastened to the narrow strip by a form of curtain fasteners which makes for easy removal. The hood member is held in place by straps fastened to buckles attached to the side board members of the frame. When utilized in the summer the hood device is intended to prevent water and moisture reaching the power plant, which might be seriously affected by it.

TUBING FOR ACETYLENE GAS.

Few cars come equipped with tubing that is really satisfactory for conveying gas from generators or tanks to the headlights. As a rule the lightest tubing is employed but this does not give good results, as it cracks, easily producing minute leaks and consequently reducing pressure. Often the burners are blamed when the fault lies with the tubing.

A heavy thick tubing should be used. This is more costly at first but better results will be obtained. Another type of tubing is the metal wound supplied by gas companies for use with the inverted mantle incandescent reading lamps. Where copper tubing is employed with short rubber tubes to complete the system, the latter should be wired where they join the lamps and at the unions.

AUXILIARY EXHAUST PORTS.

A repairman whose experience was confined to the water-cooled type of motor was asked to locate a skip in an air-cooled car. The miss was intermittent; that is, was not confined to any particular cylinder and the driver of the machine had worked for some time without results.

The usual tests were applied in the ignition system and this was found to be in order. The owner stated that he had ground the valves and the compression was approximately even on all four cylinders. The valves were retimed, which improved matters slightly. Even cleaning and readjusting the carburetor had no effect.

As the operator had assured the repairman that the valves had all been ground in, little attention was paid to them, but finally the workmen examined these members. Those on the cylinder heads were found to be seating properly. Upon replacing them the motor was again started, but it missed explosions. The auxiliary exhaust ports were next considered, and it was found that one of these was partially choked with carbon. Upon removing the soot and regrinding the seats the engine ran perfectly.

SLIPPING DISC CLUTCHES.

Multiple disc clutches require proper care if good results are to be obtained. Sometimes a car will be brought into the shop and the operator will complain that the clutch slips in starting and is slow to take hold. This may be due to improper adjustment or to the fact that a suitable oil is not being used. Too much or a too heavy grade will bring about the above result. The motor should be turned over until the oil plugs are on top and these removed. A pint of kerosene is then poured in, the plug replaced and the motor turned. This should be done slowly and by hand. Some make a practise of starting up the engine; this is wrong as at speed the lubricant is held to the circumference of the case, and does not flow through and flush the plates. After this has been done the parts are washed with gasoline and refilled with the required amount of lubricant recommended by the maker. Some utilize a mixture of cylinder oil and kerosene which is said to give good results.

SIMPLE OIL TESTS.

While there are many brands of reliable cylinder oil upon the market the owner of a repair shop is often tempted to try a new lubricant, especially if the agent quotes an attractive price. The experienced repairman, having once found a satisfactory article, sticks to it even if it is more costly than others.

Lubricating oils made from asphalt or other crudes, and then bleached to obtain a light color are said to be injurious to a motor. The acid treatment not only lightens the harmful but the better ingredients as well. This process is utilized as it is cheap, but some of the acid remains in the operation and this will corrode the cylinders and bearings if the engine be allowed to remain idle for any length of time.

The oil may be tested easily to determine if acid has been employed, by saturating a piece of cotton string or twine and wrapping it around a polished shafting or metal. This is exposed to the rays of the sun for about eight hours. If the metal be slightly corroded after removing the cord it shows that some of the acid still remains.

Weight of Belting—To find the approximate weight of leather belting in pounds, multiply the length in feet by the width in inches, and divide the product by 13 for single and eight for double forms.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

GASOLINE STRAINERS.

Many motorists strain gasoline through metal filters the mesh of which is not fine enough to prevent the passage of water or other fluids present in the fuel. Tests have shown that water will pass through a 90 sieve very easily, especially when all of the fuel has been poured. A 120 mesh, or finer, should be fitted to all straining devices as gasoline has such a low viscosity and other physical qualities that it will filter readily. Much of the deposits found in carburetors is due to poor filtration. A recent analysis developed that 48 per cent. was volatile oily matter, and of the balance 16 per cent. was carbonaceous matter and 36 per cent. fixed mineral, consisting of clay, oxide of iron and lime, fine sand, etc. It is evident that the greater part of this is road dust as an analysis of the deposit in cylinder showed the same results as that in the carburetor, in that the composition of the earthy matter was very similar.

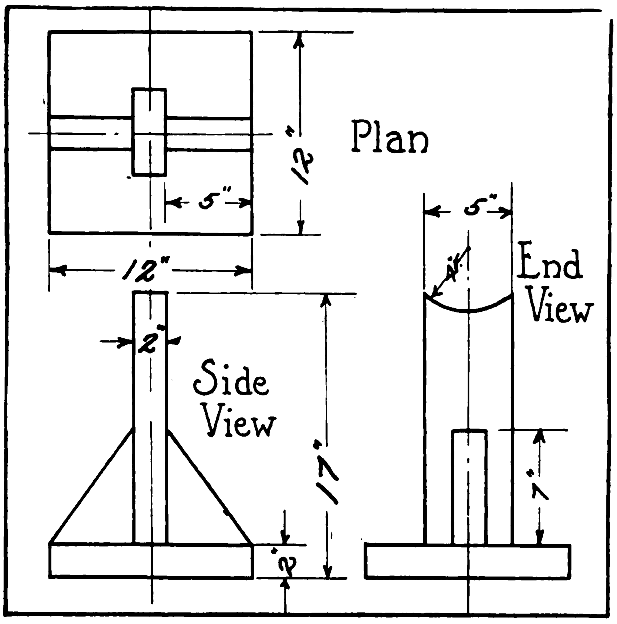


Fig. 1—Home Made Axle Support for Motor Cars.

The writer recalls an instance of this kind in a four-cylinder motor the pistons of which were covered with a gray colored substance which upon close examination proved to be road dust. The carburetor was not protected by a gauze or the engine by a pan. The air passage of the vaporizer was at the bottom of the device which permitted easy access of foreign elements. A pipe was attached and ran upward to a point close to the exhaust manifold which method not only prevented the entrance of dirt but aided carburetion. Before the advent of water jacketed carburetors and before metal pans were employed, some makers fitted a tube, one end of which was of fan shape design and placed close to the exhaust manifold.

AXLE SUPPORTING DEVICE.

Some owners put their machines away for the winter and when this is done it is essential that the wheels should be jacked up so that all weight and strain is removed from the tires. An inexpensive and easily made device for this purpose is suggested by H. M. Nichols of Kinyon, R. I., and illustrated at Fig. 1. The dimensions given are for a medium sized car and can be altered to meet the requirements of the design.

The base is made from a piece of two-inch plank, 12 inches square and attached to this is an upright, the upper end of which is recessed to take the axle, being so formed as to prevent it from sliding off the support. This is made from a 15-inch piece of 5x5 joist, one end of which is nailed to the base. The upright is braced by two triangular shaped members, five inches wide and seven high. These are securely fastened.

The application of this device is very simple. One wheel is raised by the jack, the support introduced and axle lowered until it rests in the recess of the holder. This is repeated until all four are in position. The air is then let out of the tires. Even in such a simple operation as that of jacking up a wheel the novice is apt to make errors as he is liable to place the tool in a position that is most convenient, but at the same time very impractical. It is a good plan to set the brakes of the rear wheels to eliminate the danger of the car rolling off the jack while the front members are being raised. This precaution is important, especially when the wheel is to be removed. The writer knows of cases in which the car fell, resulting in broken steering knuckles and bent spindles. Even with the wheel on, considerable damage may result, to say nothing of danger to the operator.

The proper way to jack up a front wheel is shown at Fig. 2 A. The tool is under the axle, but if the latter cannot be utilized the head of the lifting device may be placed under the spring or saddle, as denoted by the dotted lines. Another position is under the nut of the spring clip. The only objectionable feature of the latter is possible damage to the thread of the bolt in the event of the tool slipping, but this may be overcome by the insertion of a piece of wood.

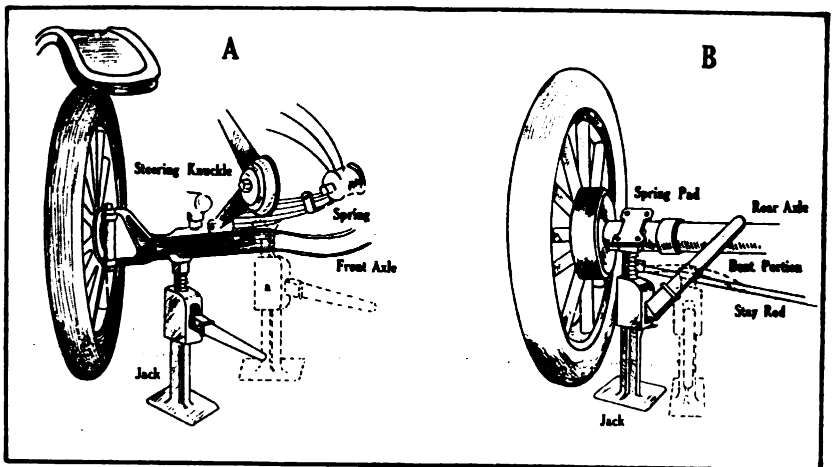


Fig. 2—Proper Use of the Jack: A, How to Raise the Front Wheel; B, Correct Position at Rear Member.

Care should be taken with the rear wheels where truss rods are employed in the construction of the rear system. The jack should not be placed so that any strain will come upon the former, although the lug to which the end is attached may be utilized. The proper location is illustrated at B. The dotted lines depict the wrong way. When this method is used much damage to the rear mechanism may ensue. If the rod be bent, crystallization is quite likely to follow, causing it to break down should a severe strain be placed upon it, and at the time it is designed to be of value and reinforce the rear axle housing. If on the other hand, the rod be flexible, elongation will take place, and if not properly readjusted, misalignment of the rear axle mechanism will be brought about. These precautions should be observed when replacing the jack with a support.

FAN BELTS AND FASTENERS.

While the modern car is fitted with a device for adjusting the tension of the fan belt there are many machines which are not provided with such an attachment. Some fans are driven by grooved or V shaped pulleys, operated by round belting. The usual manner of fastening the ends is by utilizing a C hook or fastener but these are noisy and in addition are neither neat in appearance nor secure in operation.

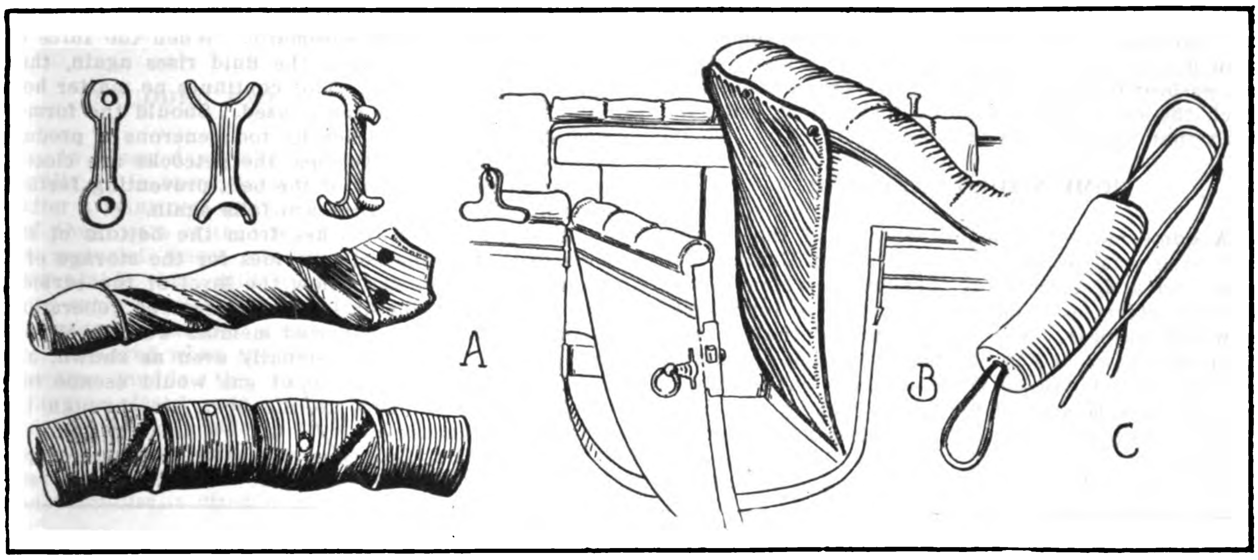


Fig. 3—Some Hints for the Owner: A, Fan Belt Hook Made from Bicycle Chain; B, Panel Body Protector; C, Anti-Rattling Speedometer Cable Device.

A twisted hide belt has many advantages over the former kind, provided it is secured firmly and this may be accomplished by using a grappler hook such as shown at Fig. 3 A. It can be made from a suitable side plate off a bicycle chain. The metal is cut across the rivet holes and the ends slightly spread. One end is twisted, as depicted in the drawing, by heating and turning with a pair of pliers. The points must be turned left or right hand, according to whether the belt has a left or right hand twist. Two holes are punched through the ends into which are inserted the points of the fastener.

Where flat belts are fitted and no provision made for an adjustment, considerable difficulty is experienced in fastening the ends as well as to obtain perfect alignment at the connection. It is a good plan to stretch the leather before using and this may be done by hanging it up for a week or so with a heavy weight attached, and rubbing into it as much castor oil as it will absorb. When ready for use bevel off the ends to a gradual taper and then get a harness maker to sew them together. A few countersunk rivets may be added. If it be dressed occasionally it will give long service.

BODY PANEL SHIELD.

Nothing detracts more from the appearance of a car than having the back panel of the front seat scratched up, especially if the paint and varnish on the other parts be nice and shiny. Some persons are careless in arranging luggage carried and this often mars the panel, particularly when there is little room in the tonneau. An owner who was careful about the appearance of his automobile, bought a new machine and before he carried passengers fitted a felt shield to the panel as shown at Fig. 3 B. The protector was so arranged that it could be removed and was held in place by the usual curtain fasteners. These were placed on the sides, top and on the floor. The device might be made longer and, rolled up at the bottom, serve as a cover for luggage in stormy weather.

ANTI-NOISE CABLE DEVICE.

Sometimes rattling noises in the car are due to the speedometer cable. When the gears are loosely meshed and the elbow joint full of play the drive shaft container will oscillate and come in contact with the steering arm. An inexpensive and easily made device is shown at Fig. 3 C, consisting of a leather lacing looped through a piece of thick rubber tube. The loop is passed around the steering arm and the ends of the lacing attached to the cable, which will secure it. The rubber forms a flexible distance piece.

RAIN WATER IN THE RADIATOR.

A prominent manufacturer of radiators recommends the use of distilled water and when this cannot be obtained advises rain water which is superior to that obtained from wells or through the pipes of the house system. When the latter is heated, especially if hard, it forms a boiler scale in the jackets of the motor which is deposited in the radiator as a fine, brick colored dust. This materially reduces efficiency and will in time clog the member. The use of some anti-freezing compounds tends to thicken the water and eventually form a deposit on the sides of the tubes. It is a good plan to drain the solution from the circulating system occasionally, and clean out the latter after which the mixture may be replaced in the radiator.

ELIMINATING CHATTERING BRAKES.

Where brakes are of the metal-to-metal type the members have a tendency to chatter and especially so when situated on the front end of the driving shaft. Oil or grease as a preventative is not lasting as a cure. A better substance to use is graphite, which enters the pores of the metal surfaces, and owing to its being able to resist the heat necessarily set up by the brake action, the benefit derived is more lasting.

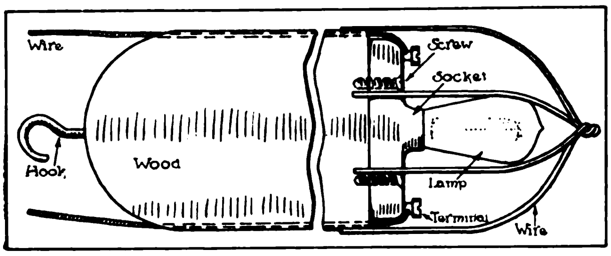


Fig. 4—Inexpensive and Easily Made Portable Lamp.

It also is an excellent material to use in lubricating clutch plates which are apt to grip harshly when the car is started from rest or in changing gears, as it appears to counteract the suction of the oil. The effect of this drawing movement is to make changing difficult in this respect when a clutch is withdrawn only partially. The reason of the improvement is again due to filling up the pores of the metal discs, and so providing an almost glass-like surface, upon which the oil suction can take little effect, with the result that shifting speeds is easier.

HOME MADE GENERATOR.

A home made acetylene generator of the "diving bell" type was designed recently by an English motorist and a description of the device, which is said to have given excellent satisfaction, is reproduced from the Autocar. The components of the gas producer are shown at Fig. 5, that at A being a sectional drawing, and it will be noted that the outer body of the container is utilized for water, baffle plates being fitted to prevent the fluid from splashing and consequent loss.

The diving bell is outlined at C, and in this are placed the parts illustrated at B, the latter including a perforated tube over which is fitted a cone. The carbide surrounds this and is prevented from falling into the water by the inverted cone fastened to a baffle plate or guide, which carries an attachment preventing the internal parts from dropping when the generator is being recharged.

The water works up through the tube from the bottom to the carbide in the event of the decomposed material blocking up the small holes in the cone and baffle plate, and sealing the clearance between the former and the sides of the container. Under the circumstances described the fluid would find exit through the small holes in the walls of this member. The top is provided with a cap to prevent the entrance of the carbide.

The action of the device is as follows: The water container is filled to such a level that when the diving bell containing the carbide and air is dropped into place it will rise to within .5 inch of that of the baffle plate. When acetylene is required, the petcocks are opened; slightly at first to obviate sudden immersion of the material and consequent waste of gas owing to its being generated more quickly than the lamps can use it. This allows the imprisoned atmosphere to escape from the diving bell and permits the water to enter at the bottom.

The rising fluid attacks the carbide at the bottom of the cone, causing acetylene to be generated. This process then becomes automatic. When the force of the gas in the bell falls, the fluid rises again, thus restoring the pressure. This continues no matter how quickly or slowly the gas is used. Should the former rise above normal, either by too generous a production of acetylene or because the petcocks are closed, the water is driven out of the bell, preventing further generation until the pressure falls again.

The space of 1.5 inches from the bottom of the cone to that of the bell provides for the storage of a small quantity of gas below the level of the carbide, and for a little fluctuation in the rate of generation. If the bottom of the inverted member were level with that of the bell, or occasionally even as shown, any momentary overproduction of gas would escape into the water, and thence to the open air through the small holes in the lid.

The box, lid, bell, cone and baffle plate are of galvanized iron, well soldered at all joints and rein-

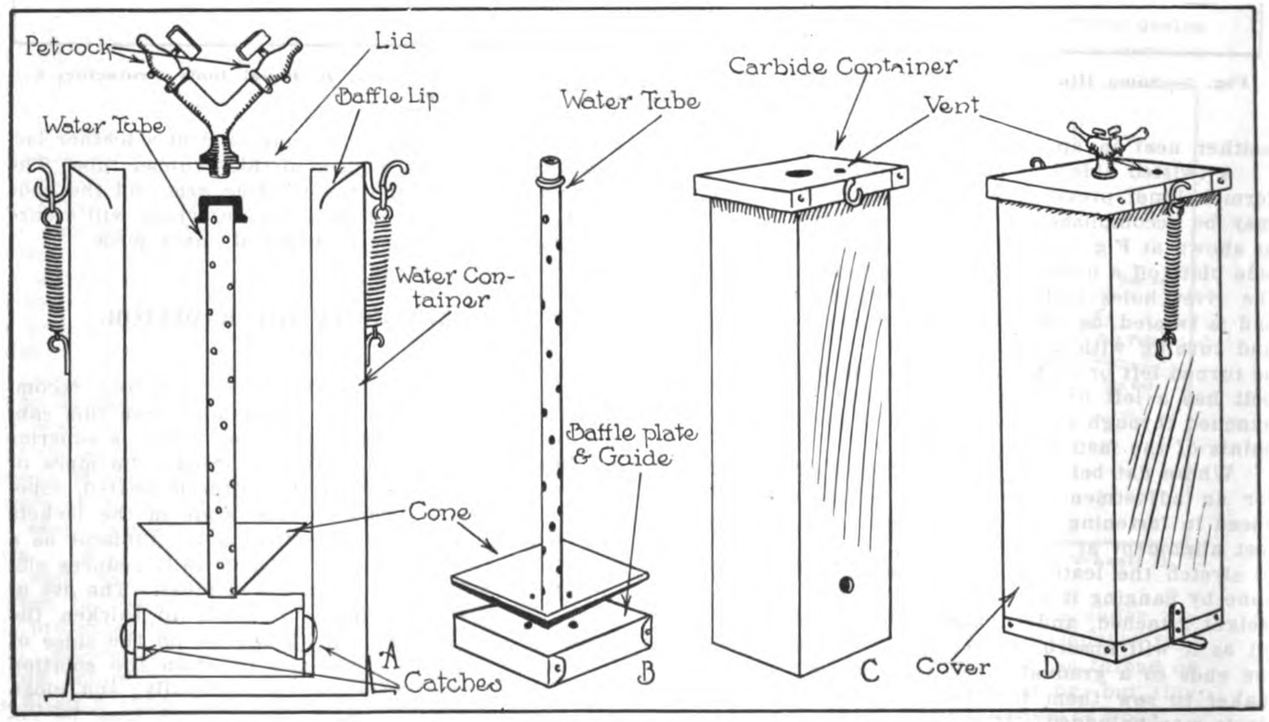


Fig. 5—Method of Constructing Home Made Generator: A, Sectional View, Depicting Components; B, Cone and Baffle Plate and Guide; C, Carbide Container; D, the Device Assembled.

forced with small rivets. The lid should be a nice easy fit, so as to drop into its place without the use of force. The twin taps or separate members will have to be purchased. The devices utilized to hold the lower parts of the bell together are similar to those used on doors or cupboards. These will have to be made in the walls of the bell and soldered to the inside of the baffle plate. In the generator outlined the holding members are steel balls and these are oiled to prevent rusting. They also are connected with a piece of copper tubing which is soldered in place to form a handle by means of which the parts may be withdrawn.

The water tube may be a piece of .375-inch brass piping such as is used for gas fittings, with small holes drilled as shown and the top closed by a cap. The tube must be soldered to the cone and baffle plate and these must have about four small holes drilled for the passage of the water.

The lid and bell are held down by miniature bonnet catches operated quickly and superior to the usual screws employed. They may be made easily from strong brass wire, and the springs can be obtained readily from any hardware store. The hooks are soldered to the lid and the eyes to the walls of the container. A small vent hole should be drilled in the lid to allow the escape of surplus water and gas. The device may be attached to the running board by means of angle brackets with small bolts and wing nuts on split washers.

STUDDED AND PLAIN TREAD TIRES.

In these days when the highways are oiled liberally it is more or less difficult to secure traction after a rainstorm and many owners fit the rear wheels of their cars with tire chains to prevent skidding. A motorist whose machine was equipped with demountable rims, utilized metal studded shoes for the two extra appliances carried on the automobile. The latter was equipped with smooth tread casings which he employed when the roads were dry, but when they became muddy, the anti-skid members were fitted. One was placed on the inside back wheel and the other on the opposite side in front. This, he claims, gave much better results than using them on the driving members. With an equipment above referred to the automobilist is fitted to meet all road conditions.

CARE OF DEMOUNTABLE RIMS.

With the introduction of the demountable rim the motorist took it for granted that being equipped with one or more extra shoes ready for attachment the troubles connected with the fitting of an ordinary tire were at an end. It is a comfortable feeling to know that in the event of a puncture or a blow-out a casing with the tube inflated is ready to slip on, and that the operation requires but the loosening of a few nuts or appliances and the readjusting of these members.

With the regular type of tire it is considered good practise to keep the rims cleaned so that the work of removing a shoe may be facilitated. The demountable rim should receive similar attention; space between it and the surface to which it is fitted, will allow water to penetrate easily and rust to accumulate. Dirt also will collect and if the device be not removed for some time considerable difficulty may be experienced in the operation.

These members should be cleaned occasionally and while the use of paint is recommended a quicker and an equally efficient method is to utilize a mixture of graphite and oil. The former is an excellent lubricant and will resist the action of the water. The writer has employed it on rims utilizing the ordinary type of tires and the latter have no signs of injury in any way by its application.

TWO-SPARK IGNITION.

As the greatest efficiency of the hydrocarbon engine is developed by the complete burning of the charge to bring this about it is essential that the spark igniting the mixture should be of proper strength. It is an established fact that when the flame is weak the power output is affected thereby. The combustion of the vapor in the cylinder of an automobile may be compared with throwing a stone into smooth water. Where the missile comes in contact with the surface a small circle appears and others follow of increasing size.

The advantage of double ignition, or two sparking plugs operating at once, has been proven by experiments, it being demonstrated that with the members placed over the inlet and exhaust valve a considerable increase of energy was derived over that of the single system. The power was further augmented by the installation of one of the devices in the centre of the explosion chamber. This is due to the fact that the gas is ignited in two places and the combustion is consequently accelerated thereby.

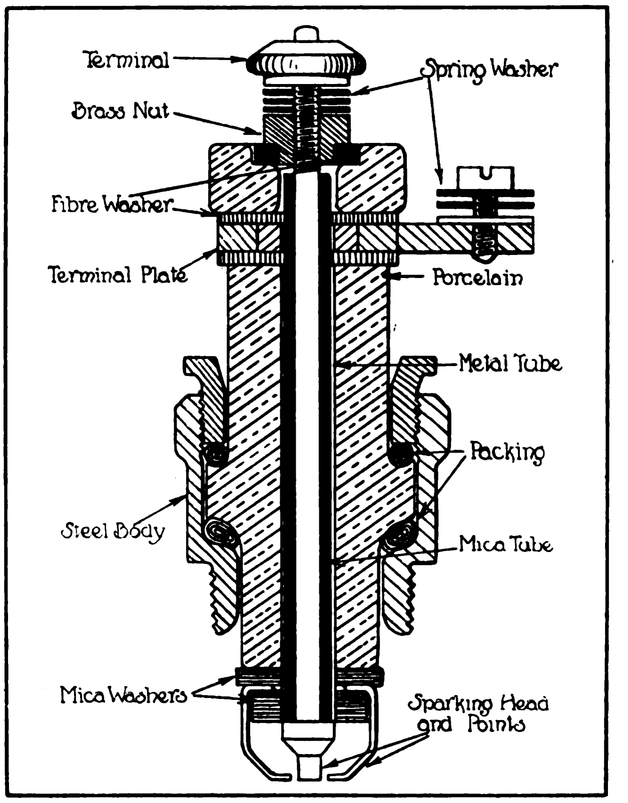


Fig. 6—Components of Multiple-Pole Spark Plug.

In fitting the double-plug system to a motor, one member should be a double-pole, the components of which are depicted at Fig. 6, and the other may be of the ordinary type. The former consists of two concentric electrodes well insulated from each other and from the metal body which is screwed into the cylinder. It will be noted that the head is longer than that of the usual device and this construction is an advantage as it will project farther into the combustion chamber.

The method of wiring is illustrated at Fig. 7. The usual high-tension lead is attached to the terminal of the double-pole member while another cable is fastened below this and led to the ordinary plug. The current first passes across the points of the former, thence to ground through the latter. In experimenting with this system the operator should bear in mind that because of the quicker burning of the charge, any advance of the spark will result in a backfire. Care should be taken to note the position of the piston at the time the ignition is supposed to take place, when setting the timer for this system.

ENGAGING THE REVERSE GEAR.

The operation of engaging the reverse gear in the sliding type of transmission is difficult to some drivers and the trouble experienced doubtless is due to the fact that with many gearboxes the action involves the enmeshing of one pinion with two others, either simultaneously or consecutively. If all three be at rest, as two are likely to be if the car be stationary, it is obvious that the meshing of them will not be an easy matter, for the chances are that either one pair or the other will not be in correct position; that is to say, each tooth will not be opposite its corresponding space.

If the clutch pedal has been depressed fully and the stop be in contact, the chamfering of the teeth will not allow those which are incorrectly placed to draw into one another. If the clutch be withdrawn slightly, just enough to allow it to touch the stop, the various shafts will be free to rotate through the few degrees necessary to allow the chamfered teeth to register. When the gears will not engage it is bad practise to jerk the lever to and fro in the hope that force will attain the object in view. Instead of this a light pressure should be maintained upon it and the clutch pedal raised gradually, so that at the moment the internal friction of the clutch tends to rotate the shafts the pinions may be engaged quietly as the respective teeth and spaces come opposite each other. A great fault with many drivers is to attempt to engage the reverse gear after using a forward speed before the car has come to rest, or vice versa. This means that they are trying to mesh gears that are revolving in opposite directions which produces noise, grinding and subsequent wear upon the parts.

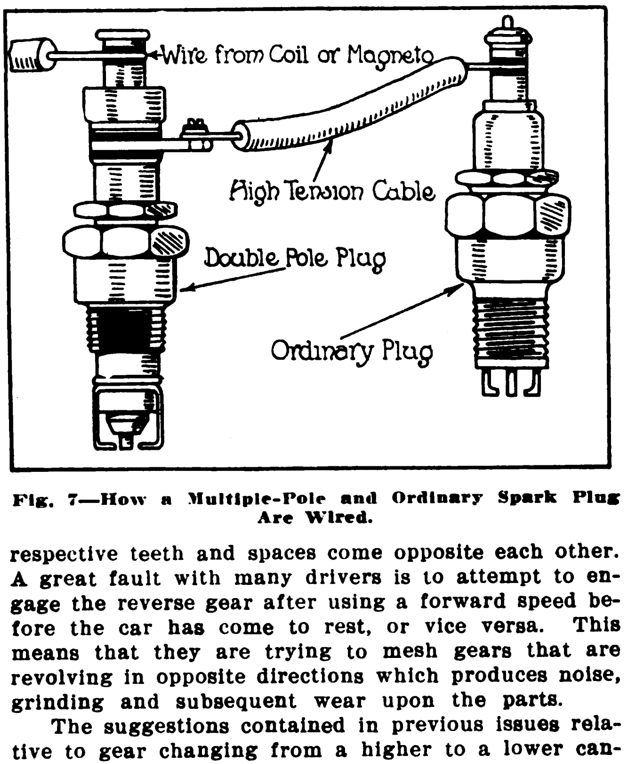


Fig. 7—How a Multiple-Pole and Ordinary Spark Plug Are Wired.

The suggestions contained in previous issues relative to gear changing from a higher to a lower cannot always be followed under some conditions, such as operating in traffic. When a car is being driven slowly on the top speed, but owing to conditions has been slowed down behind a vehicle moving at a lesser rate, this necessitates the release of the clutch and the engagement of a lower gear before resuming travel.

Under these circumstances some drivers make more noise and experience more trouble in changing down than under normal conditions, such as ascending a grade. The reason for this is that there is even more inclination to depress the clutch pedal more fully when changing down and this brings the stop in action, decreasing instead of accelerating the speed of the shafts.

The difficulty may be overcome by opening the throttle and increasing the speed of the engine, releasing the clutch partially, then moving the lever slowly from one gear to another, which should be accomplished without exerting undue force. The reason for accelerating the motor is to insure that it shall be running faster than it would if the top gear were driving, so that the internal friction, while the pinions are crossing the neutral zone when the change is being made, may increase the clutchshaft to the speed at which it will be running when the lower gear is in mesh.

In changing down it should be borne in mind that the clutchshaft must be accelerated before the pinions are meshed. If it cannot be effected by one of the methods suggested, all of which use the engine as a medium, it can only be brought about by force with its attendant noise and damage.

HOME MADE PORTABLE LAMP.

Many motorists keep their machines in a garage which is not lighted by electricity and when it is necessary to make some slight adjustment of the mechanism at night, more or less danger is present in utilizing a naked flame. There are several forms of portable electric lamps which may be attached to dry cells or a storage battery and one of these which may be made easily and at little expense is shown at Fig. 4.

The device was produced by an owner who possessed the needed materials, which consist of a six-volt incandescent lamp, a socket and flexible lamp cord. The socket was screwed to a round piece of wood about three inches long and two grooves were cut in this holder, one on either side, a strand of the wire being led to each terminal as depicted in the drawing.

Several pieces of wire were twisted together at one end and bent into a cage as outlined, while their other extremities were set into recesses in the handle of the device. The latter was then bound with friction tape to hold the ends of the protecting screen, and a hook was provided so that the light might be suspended while being utilized. The cord was of sufficient length to enable the use of the lamp around any part of the automobile, and the ends of the leads were fitted with snap terminals for the purpose of easy attachment to the battery. In the event of the bulb breaking it can be replaced by springing apart two of the wires surrounding the lamp.

WHEEL BEARINGS NEED ATTENTION.

With the approach of winter when the roads are more or less muddy and slippery due to the freezing and thawing of the surfaces, there is considerable strain upon the wheels because of skidding. The bearings and locking devices should be examined carefully and any play remedied by adjustment. Where ball bearings are utilized care must be exercised as if the adjusting cone be too tight considerable wear will follow. An easy method is to loosen the check nut and turn the cone until it bites, then slack off about half a turn, screw up and fasten the nut.

CARE OF GOGGLES.

Automobilists who use goggles, especially if they are of an expensive pattern, should not suspend them by the elastic webbing for any length of time as the material will stretch. Those who make it a practise to hang them on the steering wheel or other parts of the machine, discover that the clips must be adjusted frequently, and that sooner or later the metal buckles come in contact with the back of the ear or some other tender portion of the head, causing considerable discomfort.

Action of Electricity—It has been found that a brazed copper pipe joint may deteriorate rapidly to the point of failure by the electrolysis set up when acids or other agents attack the zinc which is one of the components of the brazing metal.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Weight of Electrical Apparatus.

(30)—Will you please tell me what is the lowest approximate weight of electrical appliances necessary to develop 80 to 100 horsepower for use in an aeroplane? What is the maximum amount of power obtainable from Vandervell's electric drive, which, I understand, was patented quite recently, and would it be applicable to aeronautic use? H. C. CLARK.

Somerville, Mass., Jan. 23.

It would be impossible to utilize electricity as a motive power for any form of aerial machine because of the heavy weight required. Thus, a motor of 50 horsepower would weigh more than 4000 pounds, while one of 150 would amount to over 11,000. This would simply transmit the electrical energy into rotary motion and would require a source of such energy. If batteries were counted upon that would add more weight than the motor itself. On the other hand, if a generator were figured upon as the source, this would require in addition an engine to drive it. The generator weight would be equal to that of the motor, while the engine would be about a tenth more. Since this is the basic condition, why resort to generator with its losses and the motor with its additional drawbacks, when the engine can be used directly and save this 8000 to 10,000 pounds?

The Vandervell drive referred to is for motor 'bus work, and probably has an efficiency in excess of 90 per cent. This is but a speed variator and requires both engine and generator.

Manifold Sizes and Carburetor Adjustments.

(31)—I desire the following information from a reliable source: What is the approximate outside diameter of exhaust pipes for various horsepowers and how is this figured? Also, the size of inlet manifolds? How may I obtain a correct adjustment of a carburetor for a wet and dry day? What must be changed and how much? R. L. McKee.

Providence, R. I., Jan. 14.

All pipe sizes are determined from the gas velocity, which is regulated in turn by the cubical capacity of the cylinders. There are distinct limits for both mixture and exhaust, these fixing the dimensions used. When the internal area has been figured in any case, it is only necessary to add the thinnest possible thickness of metal which may be obtained from the foundry. This is about .156 inch, and two walls would add twice that, or .312.

The exhaust limit is usually taken as 10,000 feet a minute, and for a carbureted mixture, it is considered that 6000 feet is the maximum. Suppose the engine is of 250 inches cubic capacity, and runs at 1000 revolutions a minute. This would give 2000 strokes, of which 500 were suction, and 500 exhaust. The amount of gas drawn in and then pumped out (not considering expansion) would be in a minute 500 times 250 or 125,000 cubic inches. This is approximately 100 cubic feet. If the limit be 10,000 feet a minute, this leaves a necessary area of but .01 square foot or 1.44 square inches. If the pipe be round, this is equal to a diameter of 1.35 inches. Similarly, with the inlet the limit of 6000 feet gives a section of .0166 feet or 2.39 inches, which is equal to a round form, 1.75 inches in diameter. When the thickness of metal is added, as previously pointed out, the outside sizes become, respectively, 1.66 and 2.06.

It should be mentioned that the exhaust is proportioned usually with the idea of each outflow of gas in one cylinder acting to create a vacuum for the products of combustion on the one next in firing order. With this in view, the sizes are often increased.

In damp weather, there is more moisture, and thus, proportionately less oxygen in the air. This is what is needed by the engine, hence the change should be such as to provide more. The fuel flow or needle setting is not changed, but the auxiliary air valve is set to open easily and thus at a lower speed. This will give the engine more air, and in that way, more oxygen, the greater quantity making up for the loss in quality. No other part of the carburetor should be touched. The same trouble is met in very high altitudes, and is compensated for in the same manner.

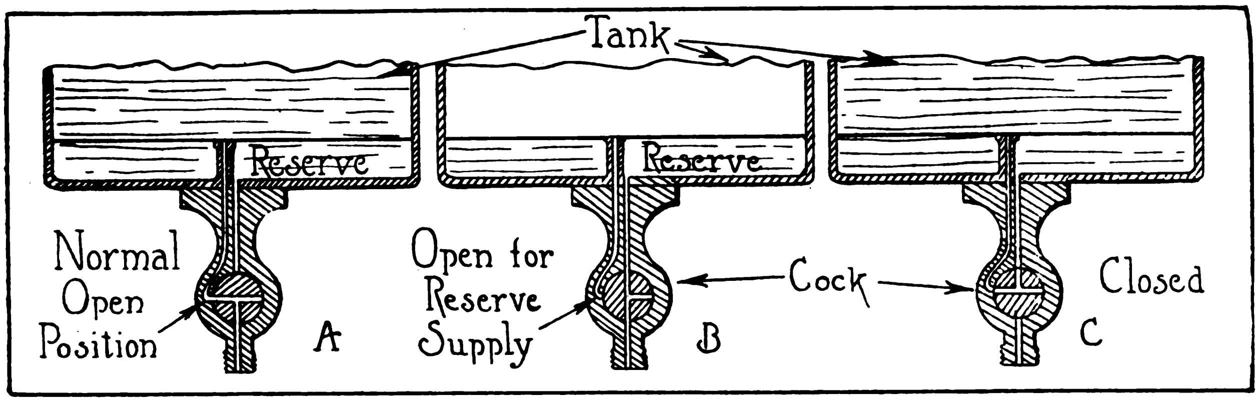


Fig. 1—Suggested Form of Gasoline Tank Reserve Arrangement with Three-Way Special Cock.

Constructing a Gasoline Cock.

(32)—Will you give me a few hints on making a cock for my gasoline tank which will be an improvement over the ordinary one-way form? I have an idea for drilling holes through the turning portion of mine so as to make it useful for other purposes; that is, by taking a two or three-way form, and drilling another hole down from the top, I thought that I could make a form of reserve out of the bottom of the tank, using the altered device with this in its two or three positions. I have heard somewhere, of a car fitted with a tank and cock of this type, and would like to make one. W. H. J. DALY.

Hoboken, N. J., Jan. 18.

It will not be possible to utilize the present cock, or the ordinary two-way form, but one can be made which will do just what this reader desires. In the accompanying sketch, this is shown in three sections, that at the left or A depicting the normal position. Here, the valve is open and the gasoline flows down the hole at the side of the cock and out into the system in a simple manner.

Granting that the supply has been exhausted, the handle is turned to the second position as outlined at B, in which the central opening is in communication with the part of the gasoline tank below the upper end, or the reserve fuel, to be exact. This flows straight through as will be noted.

At the right, C shows the third possible position, with the supply cut off. In this, a portion of the cock opening communicates with each hole, but with no outlet, hence there is no flow. In examining these sketches, it will be noted that a full half-turn will be needed from the A to the C position, regardless of the direction in which it is taken, while from B to C only a quarter twist is required.

This is the form used on a famous English car, but may be duplicated by any ambitious amateur with no other assistance than a pattern maker. Two patterns will be required, one for the body and the other to form the plug. In the average case, the lip at the top will be formed on the cock body rather than on the tank base. Little machine work will be required, other than the upper surface where the tank and cock meet, and the point where the plug turns in the body. A pattern once made for this device, a number could be constructed, and the extra ones sold to friends for enough to take care of the necessary labor.

Testing Out Carburetors.

(33)—Kindly give for my benefit some method of regulating and adjusting a carburetor float level out of the car. W. E. ORR.

Providence, R. I., Jan. 21.

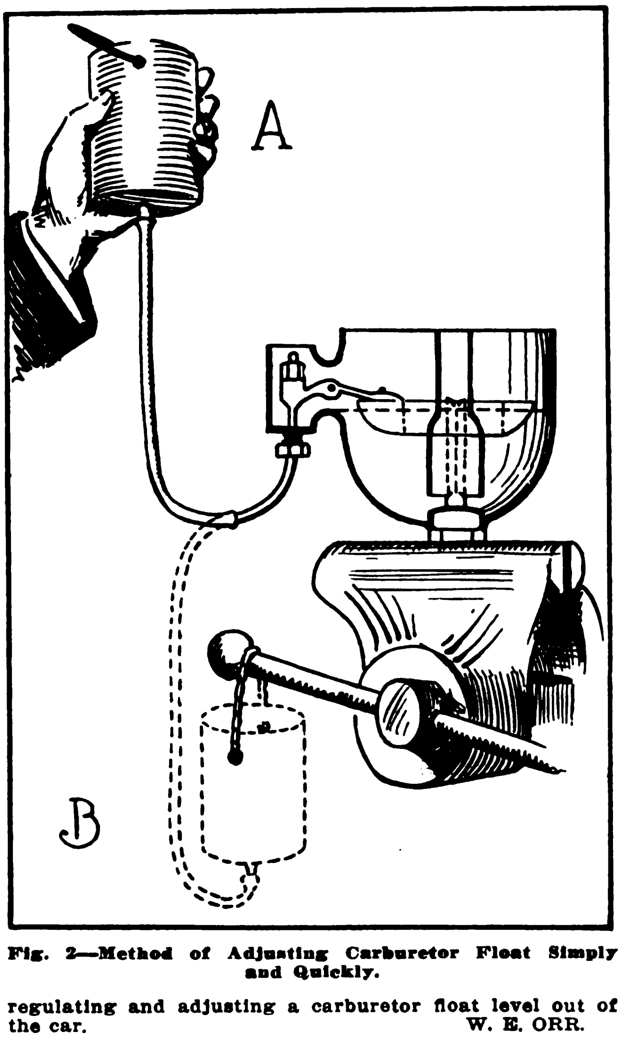


Fig. 2—Method of Adjusting Carburetor Float Simply and Quickly.

A suggestion is given in the accompanying sketch, which depicts the lower portion of the vaporizer, with cover removed, placed in a vise. A small pail or other object to hold about a quart of liquid is attached to the gasoline inlet connection by means of a rubber tube. By filling this with water, the position of it above or below the float will move the latter either up to its limit or downward as far as it can go. By removing the cover so the flow of water can be noted, and using the upper position indicated by the hand, and the lower one with the can hung on the vise handle as shown dotted, the amount of flow for the two levels can be ascertained and the position adjusted.

If the vise be attached to a work bench in the garage, it will be possible to build a shelf above it so as to answer for the upper level. This will permit the driver to get closer to the nozzle and float chamber, and thus, find out more about the action there.

Influence of Electric Lighting.

(34)—I am writing to find out if electric lights on a car lighted by magneto will injure it in any way. IRL SNHUTTS.

Bridgeport, Conn., Jan. 19.

Considering the car first, the extra current taken from the mechanical generator will not injure it in any way, and is said to have little noticeable effect upon the ignition. The sole question to arise is one of quantity; that is, does the device generate sufficient current to maintain both ignition and lighting systems? From the experiences of a number of motorists with this machine, it would appear that it does. There remains the question as to whether this system produces the right amount at the desired time.

In slowing down to turn a sharp corner in the road, the motor revolutions drop so low that the current generated is not sufficient for the lights, which have a very limited range, and consequently when one is turning a dangerous corner slowly and needs light most, it fails. The remedy is the connection of a storage battery floated on the line so that the excess will charge this, and it will then remain ready.

Fuel Consumption.

(35)—Will you kindly publish in the columns of your valuable Journal the amount of gasoline used for a one horsepower motor an hour, also how you would figure to obtain the result? I have had the question asked me many times, and according to my figuring on different sized cylinders, my figures do not agree L. N. WALTER.

Montello, Mass., Feb. 5.

The amount of fuel consumed by an internal combustion motor will depend upon a number of conditions, such as bore and stroke, number of cylinders, carburetor, work performed, etc. It is obvious that a cylinder having a five-inch bore and stroke will consume more fuel than one with a bore and stroke of three inches, all other conditions being equal. Different fuel results may be obtained with two similar engines fitted with different carburetors. There are so many conditions entering into the question that the figures obtained would only be satisfactory when two motors were tested in the same service.

The amount of fuel consumed, however, may be obtained by measurement, a practise common with motorists and others. The fuel container should be emptied, a gallon of gasoline poured in, a stick inserted, and the height of the liquid noted and marked upon the rule. The balance of the fuel may be poured a gallon at a time or in less quantities, the amount depending upon how fine the measure is to be calibrated. After running the motor for a stated period, the tank may be measured, the amount of fuel consumed noted easily and computations made accordingly.

Cracked Cylinders.

(36)—Being one of your subscribers I would like to inquire if you can inform me if the ——— car is being manufactured, and if so where? I have a 1907 model, touring car, the motor of which I think is a ———. One cylinder is cracked. I wish to repair it as I am going to sell the machine. G. W. JEPSON.

Melrose, Mass., Feb. 3.

The automobile referred to has not been marketed for some time although it is stated that steps are under way for a reorganization of the company. The address of the concern was Charlotte, Wis.

Regarding the motor, you could have it identified by some repair man or person familiar with the make, or write to the company you mention whose address is Muskegon, Mich., explaining the circumstances and giving the model of the car. The damaged cylinder may be repaired by autogenous welding process, this depending upon the nature of the fracture.

Adjustment of Tappets.

(37)—I have a model ——— car and the adjustment of the intermediate tappets works loose. I have set the lock nut up as tight as possible, but it works loose just the same. The power of the motor is considerably affected as there is too much play between the tappet and valve stem. Is there any way I can remedy the trouble as I do not wish to go to the expense of new members? The car was not new when I purchased it.

WILLIAM FORDHAM.

Bridgeport, Conn., Feb. 4.

The best repair would be to purchase and install new members. The old parts have worn through careless locking by the former owner and it would involve considerable machine work to make them satisfactory. A simple method of obtaining results with the old tappets is to unloosen the check nut and remove the tappet proper. As the locking member is recessed, the tappet should be screwed down snugly as far as it will go and the nut locked securely. Then take a piece of round steel, the same diameter as that of opening in pushrod, and cut off a number of different sized discs. Insert one or more as may be necessary to offset the space lost by screwing down the tappet. An accurate adjustment may be obtained by filing the disc if too thick and it is advisable to make the latter a trifle longer than necessary to permit of fitting. The discs may also be hardened to prevent wear.

Another method is to utilize fibre. Cut a number of discs, slightly smaller than the opening, and hammer them as hard as possible, this being done to improve their wearing qualities. The fibre has an additional advantage as it will be quieter than the metal members. The writer effected a repair to a motor of the same make by making solid tappets, and after fitting them hardening the ends. In adjusting the parts it is advisable to time the opening and closing of the valves by the marks on the flywheel, rather than by measuring by a visiting card, etc.

Charging Battery with Cells.

(38)—I read an article in a magazine describing how to charge storage batteries with electricity of the house or garage. Not having electric lights, can you inform me of a method of charging a battery without using a dynamo or house current? F. A. CARLTON.

Jacksonville, Fla., Feb. 2.

A storage battery, such as is employed for ignition purposes, may be charged with primary batteries as illustrated in the accompanying sketch. When using this system an ammeter should be incorporated in the circuit, and the zincs of the batteries let down into the solution just so far that the required number of amperes is indicated by the instrument. Instead of raising or lowering the zincs a small resistance may be introduced in the circuit, such as lamps, but as these would consume current, the other method is preferable. The number of cells employed will depend upon their type, but this may be determined by experimentation.

Adjusting Brakes.

(39)—Can you inform me why it is that the brakes on my ——— car do not hold equally? I have taken up the rods evenly on both sides, but the right hand brake does not hold as well as the other. Is there any way to adjust the members so that they will grip the same? The linings appear to be good as I have had the wheels off and examined the former.

W. S. GOODCHILD.

Cleveland, O., Feb. 5.

The reason the brakes do not grip evenly is because of the adjustment of the rods. It is a difficult matter to set the latter so that both members act the same owing to the design which is not being employed in modern motor car construction. If an equalizer, that is, a device for distributing the pressure applied, were utilized, the trouble would be overcome.

An excellent method of adjusting brakes is to jack up both rear wheels clear of the ground. Then release brake pedal and disconnect turnbuckles. Next shorten each rod a little, and move it forward and note if the brake begins to grip when the end of the rod is in a position for attaching to its holding member. Then set the brake pedal a trifle and try each wheel, noting if one grips more than the other. By shortening or lengthening the rod of the member which allows the wheel to move easier or harder than the other, the brakes may be equalized. Next apply more pressure and try both wheels, making further adjustment for pressure if necessary, but in the operation take the same number of turns with each turnbuckle.

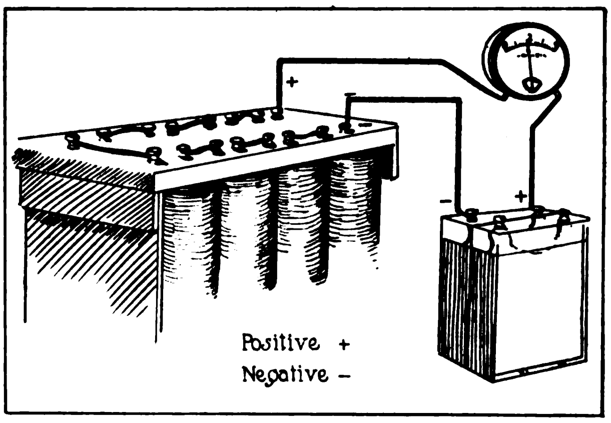
Charging Ignition Batteries.

(40)—Please publish in your columns when convenient, a description of some efficient arrangement if there be any, to charge storage batteries for ignition purposes by windmill power. I have heard that there are some successful plants of this sort in operation.

W. H. B. JACOBS.

Omaha, Neb., Feb. 1.

While the energy of a windmill might be utilized to operate a dynamo for generating a current to charge storage batteries, the writer has never seen one in practise. The variable speed of the mill would have to be regulated by fitting a governor to the current generator. In charging batteries it is essential that the flow of current be of a stated amperage, this depending upon its construction. This rate should be maintained evenly to obtain satisfactory results. Perhaps some reader has experimented with the system mentioned and will present the results obtained.



Charging Ignition Storage Battery with Primary Cells.

Starting Two-Cycle Motor.

(41)—Being a reader of your magazine I take the liberty of inquiring about a two-cycle engine which is not utilized in connection with automobiles but for sawing wood. I have used the engine for some little time with good success, but lately it is difficult to start and I have to change the mixture, giving it a richer one in starting than formerly. It is not because of cold weather as I have tested this out. It is a two-port motor and was used some time before I got it. I have tried all the things I can think of, but the trouble continues. Can you give me any suggestion as to the cause?

W. Z. CARTER.

Westerly, R. I., Feb. 7.

The description would indicate that the difficulty experienced in starting was due to a leak in the crankcase, either around the bearings or in the crankcase proper. The writer knows of an instance where a tiny blowhole in the casting, which was covered with paint, caused starting troubles after the paint wore away. This was detected by turning the flywheel until the piston was compressing the charge when a slight hissing noise was heard and traced to the hole in question. This was sealed and the motor gave excellent service thereafter. A leak of such a nature will affect the operation of a two-cycle motor, especially in starting.

Coil Gives Trouble.

(42)—I have a ——— car and have experienced considerable trouble with my coil. I have been advised to install a K-W master vibrator as the repair man claimed it would eliminate my troubles. Will you please give me your opinion as to the merits of the same?

C. T. EVANS.

Hartford, Conn., Feb. 3.

A master vibrator would improve the running of your motor and as the repair man states, prevent a repetition of your troubles. The K-W device is employed on many cars and has proven very satisfactory in practise.

Bore and Stroke Motor.

(43)—What is the proper allowance to make for stroke in figuring motor power? For instance: Which should develop most power, other things being equal, a 3.25-inch bore and five-inch stroke four-cylinder motor or one having a 3.75-inch bore and four-inch stroke?

F. B. STUDWELL.

Lake Waccabuc, N. Y., Jan. 26.

It depends largely on what is desired of the motor. In order to give a definite answer it would be necessary to learn exactly in what service the engine is to be used. However, the following suggestions may prove of value:

Taking it for granted that all other conditions are equal the efficiency of work performed with a gallon of fuel will not be the same at all times. Some engineers claim that the power attained does not increase continually in proportion to the increase in the length of the stroke, but only to a point where the rate is about 1.6 to one. This means that the energy in the charge with the growing stroke is not as efficient as at the beginning. As the burning of the charge may be said to be practically the same by a long or short stroke, a difference in power of the short stroke motor would be said to originate in proportionate loss of heat by the overlong stroke motor.

There is, however, a difference of opinion among authorities concerning this point, especially when there is but little variation in the length of the stroke of the two motors. Some contend that as the charging surface of the cylinder with a short stroke motor in comparison to the total gas contents is less than in the long stroke engine, the consequence is that there is a relatively less loss of heat in the first mentioned.

Others hold that the principal distribution of the heat takes place at the moment of the explosion and therefore claim in respect to the heat losses that only the surface measurements of the compression chamber at that time may be considered, which, of course, favors the long stroke.

The facts appear that as far as the motors are concerned the efficiency is the same in both types, provided, of course, that the proportions are normal. To obtain full value of the expansion a certain piston speed is necessary, thus giving the short stroke motor more revolutions than the longer stroke. Therefore, before selecting the engine it is well to know the work required of it. For light cars where high speed is desired, the short stroke generally gives satisfaction, but on heavier machines the slow speed motor has many points which may well be recommended.

According to the formula of the Society of Automobile Engineers, the motors described would be rated as follows:

Three and one-quarter-inch bore and five-inch stroke, 17 horsepower; 3.75-inch bore and four-inch stroke, 22.5 horsepower. These calculations are based upon an assumed piston speed of 1000 feet a minute.

Excessive Lubrication.

(44)—I have been troubled with over lubrication in a ——— car. The No. 1 and No. 2 cylinders are at fault as the exhaust valves have to be cleaned about every 350 or 400 miles and the combustion chambers are always soaked with oil. The first cylinder gives more trouble than the second. The others work properly. This fault developed after the car had been run about 1000 miles.

The lubrication is by the constant level splash with circulating pump. The oil splashers or dip pans were dipping .25 inch. I shortened these to .1875 inch, as advised by the maker of the car. It stated it were of the opinion that the pistons were too small. I have shortened the splashers to .125 inch in the No. 1 cylinder and to .15625 inch in the No. 2. This has not helped any as I can see. I have the motor disassembled but the pistons and cylinders do not show any wear.

There are four .5-inch holes through each piston about 2.5 inches from the open end. I suppose these are for lubrication. Do you think it would help this trouble if I stopped up these openings in the troublesome cylinders? Would there be any danger of these cylinders not getting enough oil? If I stopped up the openings would it be necessary to cut grooves on the piston as suggested in an article appearing in your magazine some time ago?

GEORGE DOTTS.

Eddyville, Ia., Jan. 27.

The closing of the openings of the pistons should not be attempted unless recommended by the maker who should be able to help remedy the trouble. It may be that the pistons and rings do not fit properly as the maker suggests. It is possible that the front springs have settled and that the front part of the crankcase is lower so that oil gathers, creating an over supply. If the crankcase be not fitted with partitions this may be the trouble.

Holding Brass Pipe in a Vise—When cutting threads on brass pipe it is often desirable not to scratch or bruise the surface. The mechanic usually makes jaws by taking two pieces of wood and boring a hole on the line where they are joined together. The pipe is then placed between the jaws in the half round holes and clamped tightly in the vise, which will not always hold securely when using the die. A little powdered resin applied to the half round recesses in the wood will grip the pipe sufficiently for the work.

When Horn Reed Is Deformed—Take a stout pin and introduce it transversely beneath the reed pushing it back as far as possible. Then with a pliers bend down and straighten the reed until it is about in its original position all along the tongue. Replacing the reed in the tube and testing from time to time will assist in determining the proper degree of straightening necessary. If a particle of dirt has lodged underneath the reed in a horn, causing the horn to become mute, it can generally be dislodged by tapping the reed tube and operating the bulb at the same time.

Sawing Thin Bars—Those who have had the job of cutting thin brass or copper tubing with the hacksaw are acquainted with the difficulty usually encountered as a result of the tendency on the part of the saw to bite into the walls of the thin tubing. This difficulty can be easily overcome. An old hacksaw blade, which has outlived its usefulness, is all that is necessary, and therefore the method is one that fits in well with shop economy. The teeth of the blade are first ground down with an emery wheel until only very small teeth projections remain.

To Clean Brass Articles—Take six large spoonfuls of cider vinegar and two spoonfuls of salt, and put in a bottle and keep ready for use. Apply with a small cloth, rubbing well. All stains will disappear and the brass will be as bright as when new. Wash the vinegar off after polishing, and dry the brass, as it will become discolored if left on.

When sawing across the grain in very hard wood, like lignum-vitae, thoroughly seasoned oak, or hickory that is very hard, the ordinary rip saw will cut very much faster and better than the cross-cut saw, which is the only thing that will work satisfactorily on the soft woods.

WHO'S WHO IN THE INDUSTRY.

RADFORD TO MANAGE CARTERCAR INTERESTS.

Harry R. Radford, who for several years has held the position of general sales manager for the Cartercar Company, Pontiac, Mich., now assumes the management of all Cartercar interests, except the manufacturing department. This change follows the recent resignation of R. A. Palmer as general manager of the company. The latter was one of the original organizers, but other business interests compelled him to relinquish his position.

Although considerable speculation took place when it became known that Mr. Palmer was leaving, as to who would succeed to the general managership President Thomas Neal of the General Motors Company, of which the Cartercar company is a part, announced that it had been decided upon to dispense with the position.

Harry R. Radford, Manager Cartercar Company.

This will bring under Mr. Radford's supervision the departments of advertising, selling, credit of agents and the directing of the seven branches in New York City, Philadelphia, Detroit, Chicago, Kansas City, Los Angeles and San Francisco. The management of the factory will be under the direction of the production manager.

GRIFFITH SECURES PROMOTION.

Harry W. Griffith, General Manager Remy Electric Company.

Harry W. Griffith of Indianapolis, Ind., who has been secretary-treasurer of the Remy Electric Company, Anderson, Ind., well known maker of ignition specialties, since Stoughton A. Fletcher bought the plant some months ago, has been appointed general manager of the company, vice W. R. Poland, resigned. Mr. Griffith has had a long experience in the manufacturing business, having been connected with the American Creasoting Company of Chicago before joining the Remy concern. His many friends in the automobile industry will be pleased to learn of his promotion to his new position, one which he is duly qualified to fill with success. The change became effective Jan. 18.

Mr. Poland has organized the Simplex Manufacturing Company, to produce and market a new mechanical self-starter for automobiles, and has disposed of his interest in the Remy Electric Company. Associated with him will be W. S. Poling, G J. Derthick and James Stanley of Anderson.

BELIEVES IN INDIANA PRODUCTS.

H. C. Lathrop, secretary and treasurer of the Henderson Motor Sales Company, Indianapolis, Ind., distributor for Cole cars, whose photograph is presented herewith, believes that every automobile manufactured in the State of Indiana should be represented in Indianapolis. He believes that this city holds the same relation to the automobile industry in Indiana as Detroit in Michigan, and that it will not be long before the capital of the Hoosier state will have as strong prestige in the country as the Michigan city.

"Out of the 64 pleasure and commercial gasoline vehicles and electrics manufactured in the Hoosier state but 25 have representatives in Indianapolis," says Mr. Lathrop. "The manufacturers who are represented here get the brunt of the business as a result. I firmly believe Indiana makers should have offices in the largest city in the state.

"Just look how automobile row is growing in this city. Through the efforts of Carl Fisher, North Capitol avenue, one of the fashionable streets, is being built up into an automobile district. Indiana has more car factories than any state in the Union and there is no reason why the statisticians at Washington in 1913 should not find the number of cars manufactured in this state are up to a much higher figure than recently announced."

H. C. Lathrop, Secretary Henderson Motor Sales Company.

Among the recent firms who are now in new quarters or who will shortly move into new places of business are the makers of the De Tamble, Richmond, Westcott and Haynes cars, Firestone and Diamond tires, Stromberg carburetors and Stewart speedometers. A new building is being erected for the service department to be maintained by the Henderson Motor Sales Company.

B. Frank Blaney, for two years sales manager of the Johnson Service Company, Milwaukee, Wis., is now sales manager of the Havers Motor Car Company, Port Huron, Mich., and is making agencies in the eastern states.

The American Rim Company has established offices and salesrooms at 250 West 54 street, New York, N. Y., and has organized a vigorous campaign for marketing Lambert demountable rims.

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Devoted Exclusively to the Automobile Trade and Allied Interests

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Remittances should be made by Check, Draft, Postoffice or Express Money Order, or Registered Letter. Money enclosures must be at sender's risk.

PRESERVING TRADE INFORMATION.

One of the most valuable adjuncts to an accessory and supply business is the trade information instantly available, for many requests are made by customers who have but vague knowledge of what they desire to examine or obtain. This means with the well ordered concern a systematized reference that can be consulted instantly and which is kept up to date. Perhaps the better method is a file of catalogues and another of the circulars and booklets that are received from time to time, each of which should be arranged alphabetically at least, and where it is possible each article should be kept separately. The time required for classification of the information may be regarded as prohibitive by some, yet the saving is great when one considers how many individuals make inquiry during a year. It may be well enough to have a house cleaning occasionally, which will permit a restoration of the papers that have been misplaced and restore the files to the height of efficiency. The literature sent out by the manufacturers and jobbers is for the benefit of the trade and the possible customers. It is useful to the valuation placed upon it by the business man, and were there realization of the possible saving of time and the better serving of the patrons it is very probable there would be one or more complete files in each store or office.

ADVISING THE CUSTOMER.

Business men are often asked by customers to advise them, and the subjects are as numerous as the patrons. The man who conducts a garage and has a mechanical knowledge born of experience ought to be versed in principles, if not in practise, but the individual who maintains a store cannot be expected to have the knowledge as dependable as that to be obtained from the practical man. It is certain enough that the dealer ought to know of proportions, dimensions, capacities, etc., but with a matter of 200 diffent makes of cars and 150 makes of service wagons now produced, to say nothing of types existing but no longer manufactured, it is somewhat discouraging to reflect upon the possible demands that might be made upon a motor vehicle Solomon. And in addition to all this there is the prospect of request for information relative to several thousand different articles of equipment and supply. The man who will select the best of each line from the varying products must either be exceedingly well informed or surprisingly ignorant.

VALUE OF THE STOCK DISPLAY.

Those who have the opportunity for the display of stock should make the most of every article that is received. The manner of showing is entirely a matter of judgment and must depend upon the facilities for exhibition, but with goods having both constant and seasonable sale it is possible to make frequent changes and to exhibit a wide diversity of stock. One need merely recall his own experience with another's exhibit to realize that arrangement is a very potent factor, and to understand that progression or stagnation is often evidenced to the public without more than a glance while in passing. Moreover, it is very human to want the new and the improved, and these qualities are not sought where there is little or no activity. This fact obtains the world over and rarely is exception made. It should be remembered that demonstrations of service and efficiency are always valuable and that these can be made from time to time with admirable results.

WHAT CONSTITUTES SALESMANSHIP.

The salesman who understands selling always finds that his most valuable asset is his knowledge of the market so far as the products he is handling are concerned. This does not mean that it is necessary to discredit another line, but it is only by knowing the exact qualities of the articles that he is able to inform the customer of them and to advise whether or not they will meet requirements. It will be seen that this means keeping pace with at least all standard productions, where they are used as regular equipment, and where they have been utilized. The explanation by a careful salesman of an instrument or device is often necessary to satisfy a customer that it is what he desires, and unless he is capable of doing this when desirable the clerk is not alive to his own usefulness and his employer's business interests.

UP-TO-DATE ELECTRIC GARAGING.

As a pioneer in the electric vehicle garage business I have learned many things that experience only can teach. I am glad to offer some suggestions which, if followed, will prove of mutual profit and benefit to both the garage owner and the customer.

The prevailing custom is to give a service, which includes calling for and delivering the car once a day, storing, washing, charging and general care, such as brake adjustments, tire inflation and oiling, for which they pay a fixed monthly charge.

In the one instance an owner will get his car early and use it late, requiring a full charge each night and a thorough cleaning. In another instance an owner will use his car but a few hours each day. It is easily cleaned and but little current put in.

In either instance cited the operator knows he or she can drive carefully, avoid mud holes and be saving of current, or be as careless and extravagant of current as one chooses. It costs the owner just so much anyway. It is a fact that with one the garage loses money, and with the other makes some. The average is satisfactory. But under this arrangement we are penalizing the careful driver by making him pay for the other driver's indifference. This is wrong. Anything that will make a driver avoid a mud hole or cause him to handle his car more carefully is a good thing for the owner, the car and the business. My plan gives a man what he pays for and he pays for what he gets.

When a customer 'phones for his car, a tag is filled out. It gives the owner's name and address, states the time he 'phoned and gives the time and place for delivery. This tag is placed on the call board where the call boy finds it and when he starts to deliver he takes the tag, stamps it under the time clock, puts in his pocket, delivers the car and returns, stamps the card again with his initials between the stamps, and the customer is charged accordingly.

The same method is employed in calling for the car, excepting that person receiving the message in addition to getting the time and place for calling also notes on the tag any instructions the owner wishes to leave regarding the car. When the machine is brought in the tag is left in the car. The floorman notes this tag and if the car is to be washed it is sent to the rack where the washer again stamps the tag before he starts in and after he is finished.

This stamping of the tag applies to all work that is done on the car by whoever happens to do it, and insures an exact record of just what is done, when it was done and by whom. These tags, when filed away, are not only a complete record of the car itself but enables one to keep an accurate check on every employee's time.

Storage, of course, is handled at a flat rate per month. The current is sold by the charge or kilowatt.

This system may need modifying to adapt itself to different local conditions, but the principle is right. It encourages careful and economical operation of the car and there is never any misunderstanding or complaints about the bill when it comes in, and the garage man knows he is being paid for what he does and there is no idle time for which either he or his customer pays.

R. H. MORRIS,
Manager, Electric Vehicle Department, Pioneer Automobile Company, San Francisco, Cal.

MILLER MOTORING EYCYCLOPEDIA.

One of the most striking illustrations of the proportions of the motor vehicle industry and those allied with it is the catalogue of Charles E. Miller, than whom there is no better known firm in the world. The name of Miller is synonymous of motoring, as it was of bicycling in the halcyon days of the silent steed, a condition that must obtain when it is known that no less than 15 separate stores are conducted under this name. And in addition more than 100,000 catalogues with more than 250 pages are distributed to all parts of the globe.

The Miller catalogue is compiled annually. It is the largest and most complete reference published and notes, pictures and describes every part, accessory and supply that is handled by Miller. Miller does not deal in motor vehicles, but it is possible to buy any part of one that may be needed for replacement or restoration, and any part of any equipment that may be desired. It is possible to order a new engine, a new transmission, a new axle, a new top, a garage outfit, a repair shop installation, a fuel station system, or, in fact, anything that is wanted for any particular service, as well as special machinery.

The detail of the innumerable subjects entering into the Miller stock is told of in the catalogue, as well as the prices, so that those who have the book may use it at all times for a reference for proportions, sizes, etc., a quality of much value. The products of the best of Europe's makers are carried by Miller besides everything that America produces. The lubricant division of the business is really a distinct enterprise in itself, this distributing the Pan-American oils and greases.

Miller is the sole distributor for many devices and appliances that are widely utilized and are especially serviceable. He is frequently consulted by those who are about to engage in production of a new article and desire the advice of a man whose judgment of marketing possibilities is regarded as safe. Miller is the biggest buyer in the United States, for he not only has his own distribution to other dealers to provide for, but he has his own retail stores. Miller imports and he exports, and he manufactures. He has as a whole the largest automobile supply house in America and besides the motor car he can equally well supply the needs of the motor yachtsman, the motorcyclist and the aviator.

Miller's main office is 97-103 Reade street, New York City, and there are two branches in Manhattan and one in Brooklyn. Besides these there are stores and distributing stations in Boston, Philadelphia, Cleveland, Detroit, Buffalo, New Orleans, Albany, Newark, N. J., Springfield, Mass., Hartford, Conn., and Atlanta.

The Miller catalogue is worth studying. It contains more real information for those for whose benefit it has been published than any other work one might instance. It is a big catalogue, but in proportions it is representative of the business it describes. It might well be designated as Miller's motoring encyclopedia.

WILL BUILD COLBY TRUCKS.

The Colby Motor Company, Mason City, Ia., has passed into the hands of men who propose to enlarge its activities. The new officers are: President, J. E. Burmeister; vice president, W. M. Colby; treasurer, H. S. Murphy; secretary, W. N. Smith; general manager, D. W. Henry. Mr. Colby was executive of the original company. The new men are largely interested in the National Farm Machinery & Implement Company, which has a capital of $5,000,000. The company will continue to produce its line of pleasure cars, but will also engage in the manufacture of service wagons and trucks.

The Winton Motor Carriage Company has established a factory branch at Spokane, Wash.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Hercules Tire Company, New Orleans, La.; capital, $50,000; incorporators, Dr. J. M. Underwood, president; Sim J. Connell, vice president; Walter J. Manion, secretary; Martin H. Manion, treasurer; Leslie Dunn, manager.

La Salle Auto Oil Company, Chicago; capital, $25,000; incorporators, W. R. Watson, G. W. Curtis, L. E. Powell.

Hubbard Motor Car Company, Clio, S. C.; capital, $3000; incorporators, J. L. Hubbard, Hugh McLaurin.

The Direct Drive Gear Company, Paterson, N. J.; capital, $500,000; president, Henry C. McBrair; vice president, Charles D. Cooke; treasurer, C. A. Isleib; secretary, David G. Rogers; general manager, C. E. Garrabrant.

Overland Sales Company, Petersburg, Va.; capital, $15,000; incorporators, J. T. Burgess, president; D. P. Weeks, vice president; D. H. Burgess, secretary and treasurer.

Noble S. Bruce Auto Company, Shelby County, Tenn., increase of capital stock from $10,000 to $50,000. The incorporators are: J. W. Bruce, C. E. Boloate, Noble S. Bruce, John S. Parker and C. H. Thomas.

Land S. International Airless Tire Company, Camden, N. J.; capital, $100,000; incorporators, J. H. Nixon, Irving Zimmerman, Thomas B. Hall.

Michigan Auto Joint Company, Grand Rapids, Mich.; capital, $10,000; incorporators, Charles E. Perkins, J. F. Carter, F. S. Perkins.

White, Binford & Robinson Motor Company, Boston; capital, $20,000; incorporators, Albert C. White, Jr., president; Cecil P. Robinson, treasurer; Henry O. Cushman.

Lakeaero Company, Augusta, Me.; capital, $1,000,000; incorporators, E. J. Pike, president; L. J. Coleman, treasurer; C. L. Andrews, clerk.

United Automobile Owners' Protective Association, New York City; capital, $25,000; incorporators, H. E. Troid, H. A. Trebing, A. J. Davenport.

International Motor Service Association, New York City; capital, $100,000; incorporators, W. H. Brealey, W. W. Friend, I. A. Monsees.

The Dayton & Troy Automobile Company, Dayton, O.; capital, $10,000; incorporators, C. E. Emrick, S. S. Faulkner, W. J. Sherer.

Etheredge Motor Company, Columbia, S. C.; capital, $10,000; incorporators, E. J. and C. L. Etheredge, R. L. Mitchell.

Cavac Motor Car Company, Wilmington, Del.; capital, $500,000; incorporators, Claude L. Roth, Charles A. Verschow, John W. Brady.

William Marshall, Inc., White Plains, N. Y.; capital, $20,000; incorporators, William Marshall, Marguerite Young, John Hamilton.

The Shaw-Lundin Auto Company, Kittery, Me.; capital, $10,000; incorporators, Burton W. Shaw, Newton Center, Mass.; Thomas F. Malone, Horace Mitchell.

Vera Motor Car Company, Boston; capital, $100,000; incorporators, G. M. Poland, president, Wakefield, Mass.; M. A. Sweeney, treasurer.

Chalmers Memphis Company, Memphis, Tenn.; capital, $5000; incorporators, H. C. Luckett, J. M. Stoeckle, P. W. Lytle, F. J. Rambler, W. P. Biggs.

McClurg Tire & Rubber Company, Boston; capital, $12,000; president, John E. Horne; treasurer, Kirke L. Moses, 103 Massachusetts ave., Boston; John S. McClung.

Imperial Auto Sales Company, Madison, Wis.; capital, $10,000; incorporators, Arthur F. Teigs, Mrs. Arthur F. Tiegs, Joseph E. Farber, Mrs. Joseph E. Farber.

Hydraulic Motor Vehicle Company, Milwaukee, Wis.; capital, $15,000; incorporators, Calvin Stewart, August Baltzer, W. M. Stewart, W. E. Brown.

Seymour Auto Company, Seymour, Conn.; capital, $4000; incorporators, Ernest S. Clark, Thomas S. Coleman, Edward F. Coleman.

Penoa Motor Oil Company, Los Angeles, Cal.; capital, $25,000; incorporators, J. P. Smith, Joseph A. G. Brown, M. B. Armstrong.

The Capital City Automobile Company, Austin, Tex.; capital, $35,000; incorporators, Pierre Bremond, W. M. Graham, Howell J. Grinnan, R. M. Thomson, Jr.

Rowe Motor Manufacturing Company, Camden, N. J.; capital, $500,000; incorporators, Charles Def, Marion Lambert, Florence M. Caskill, 104 Market street, Camden.

The Standard Motor Car Company, Tulsa, Okla; capital, $5000; incorporators, W. L. Walker, William S. Baker, Clarence B. Sexton.

Amerital Manufacturing Company, New York City; capital, $200,000; incorporators, W. O. Turrell, S. Seognamillo, L. W. Schwarz.

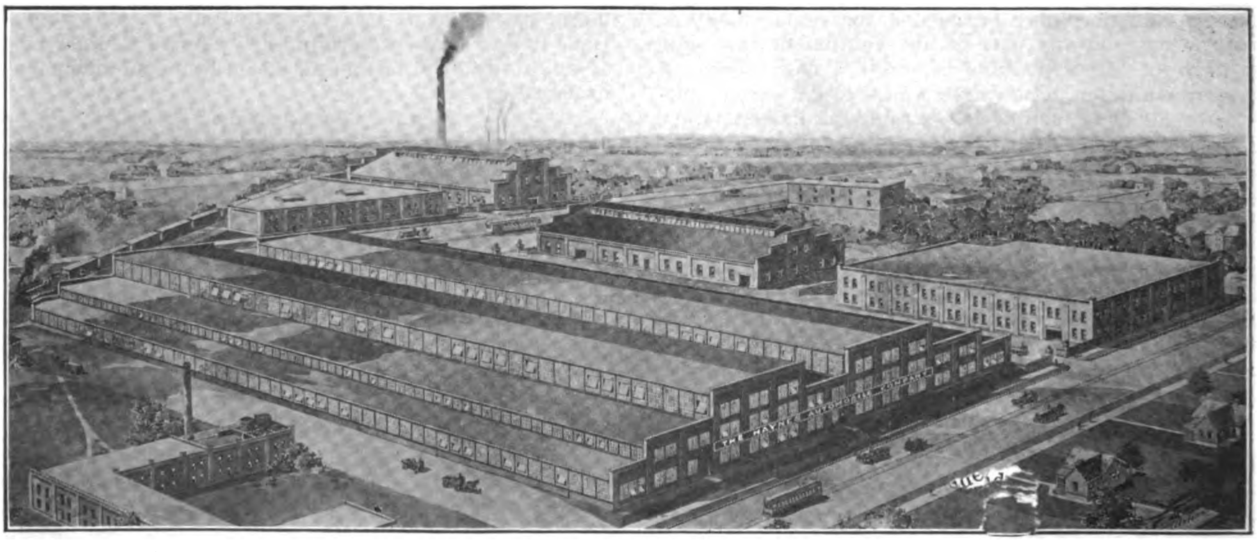
United States Co-Operative Automobile League, Cambridge, Mass.; capital, $250,000; incorporators, George F. Mings and others.

Delamater-Byrnes Automobile Company, 10 West 60th street, New York City; capital, $30,000; incorporators, J. D. Delamater, M. B. Byrnes, W. A. Shepard.

Bicknell Auto Company, Bicknell, Ind.; capital, $15,000; incorporators, E. T. Hollingsworth, S. S. Hollingsworth, J. A. Keith, H. A. Murray, John Carrico, Robert McClure, W. V. Gates.

Randolph Motor Truck Company of Delaware, New York City; capital, $200,000; incorporators, H. O. Coughlin, Welcome W. Bender.

Bernhard & Turner Automobile Company, Des Moines, Ia.; capital, $60,000; president and treasurer, J. C. Bernhard; vice president and secretary, Jay E. Turner.



Factory of Haynes Automobile Company at Kokomo, Ind., the Six Buildings of Which Provide a Floor Space of 400,000 Square Feet.

Oakland Auto Company, Richmond, Va.; capital, $15,000; president, R. H. Bruce; vice president, S. V. Gregory; secretary, G. T. Sharp.

Patton Aeroplane Company, Montgomery, Ala.; capital, $60,000; incorporators, Moses F. Patton, John L. Tyler, Hugo F. Budermann.

Interstate Tire & Rubber Company, New York City; capital, $500,000; incorporators, R. H. Falbaum, M. A. Gentry, L. R. Strauss, I. H. Falbaum, Atlanta, Ga.

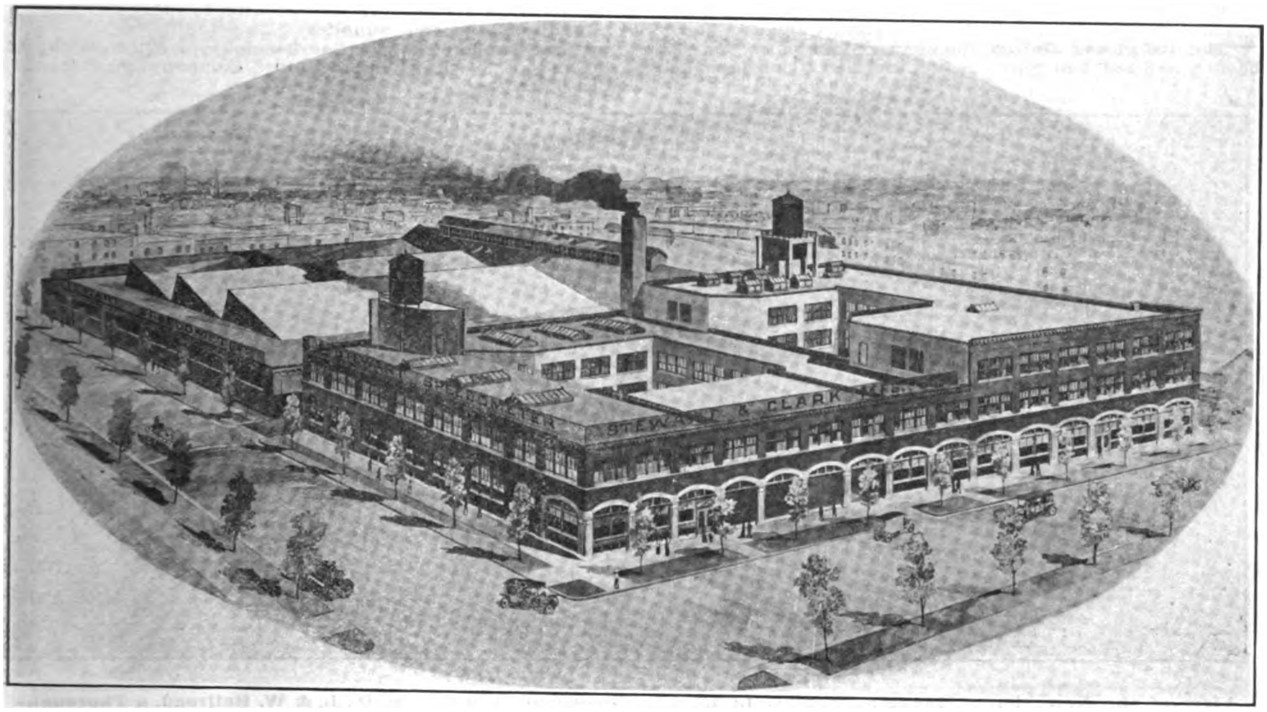
GARAGE & DEALER

Ralph F. Coburn has been placed in charge of the Stoddard-Dayton Sales Company, with headquarters at 94 Massachusetts avenue, Boston.

Leslie P. Bucklin has been appointed general manager of the Fred E. Gilbert Company, Jacksonville, Fla., to succeed John E. Kay. Bucklin was formerly connected with the Florida Times-Union.

Edward Baden, Independence, Kan., has leased the Schoenfeldt building and after extensive alterations will open a first class garage. He represents the Overland, made by the Willys-Overland Company, Toledo, O.

A. H. Stephens and Wilbur Johnson have taken charge of the Viertel garage, Main street, Booneville, Mo., and will make extensive alterations, including the fitting of a machine shop. The firm will include tire repairing among its departments.



Extensive Plant of the Stewart & Clark Manufacturing Company, Chicago, Well Known Maker of Speedometers, to Which a New Building Was Added Recently.

The Southwestern Cole Company, Dallas, Tex., has been appointed distributor of the Cole line, made by the Cole Motor Car Company, Indianapolis, Ind., and will have a large share of the Texas, Oklahoma and Arkansas territory. The officers of the company are: President, W. F. Bridwell; vice president, W. Y. Foster; secretary and treasurer, C. B. Foster; general manager, C. F. Hurst.

F. J. Bohn, Arlington, Cal., will erect a brick garage, 50 by 80 feet, on Magnolia avenue.

The Pathfinder Motor Car Company, Los Angeles, Cal., has leased the building at Pico and Hill streets, formerly occupied by the Los Angeles Motor Car Company.

Thomas Botterill, one of the oldest motor car dealers in Denver, Col., is occupying new quarters at 1274 Broadway, that city. The new structure is of pressed brick and is 50 by 125 feet. The salesrooms and offices are on the ground floor.

The Big Cedar Auto Company, Osage, La., has succeeded the West End Garage. Benjamin Colton and B. K. McIlnay were the purchasers and they will conduct a garage and handle the Overland and Ford lines.

W. J. Leguerrier has opened a garage and repair shop at 5020 Easton avenue, St. Louis, Mo. He will also conduct a second hand automobile business.

The National Automobile Training Association, Omaha, Neb., has purchased a tract of land on Twentieth street, and will erect a garage for gasoline and electric vehicles.

The Newton-Humphreyville Company, Newark, N. J., is occupying new quarters at 124 Washington street, which will be used jointly with the Ellis Motor Car Company until the latter's new building is ready for occupancy.

Wells & Morse, Johnstown, N. Y., Cole agent, has moved into new quarters and will be known in the future as the Cayadutta Garage.

G. A. Gillette and Stephen Zielinski, Rochester, N. Y., have filed plans for a new garage on East avenue. The proposed building will have a frontage of 33 feet and a depth of 115 feet. It will be constructed of brick and will cost about $13,000.

R. F. Ford and E. and B. Starbuck, Peoria, Ill., have consolidated and the new concern will be known as the Starbuck Sales Company and will handle the Cole line on a large scale.

W. P. Forbes, Richmond, Va., has moved from 10th and Byrd streets to new salesrooms and service department at 1631 West Broad street.

Carl Dearborn, Biddeford, Me., has purchased the business of the late Daniel H. B. Hooper on Washington street and will conduct a garage in the future.

W. H. Downey of Rochester, N. Y., has succeeded W. S. Horton as manager of the Stoddard-Dayton garage at Syracuse, N. Y.

John D. Quinlan has taken the agency for the Schacht car, made by the Schacht Motor Car Company of Cincinnati, O., for Syracuse, N. Y. Associated with Mr. Quinlan will be E. G. Coe.

The Inter-State Sales Company of Galveston, Tex., announces the opening of a branch at Houston. The company handles the Inter-State, Thomas and Everitt line and recently expended $25,000 for a garage, salesroom and machine shop at Galveston.

Harry Minchin has opened a machine shop for motor car work at 48 Lafayette street, Greenwich, Conn.

Ullman Bros., Springfield, Mass., has awarded a contract for a garage to be erected on Market street. It will be two stories in height.

John R. Jones, Atlanta, Ga., has purchased the Rome Motor Car Company from A. R. Sullivan. Varnell Chambers will manage the new concern.

Arthur F. Clough, formerly with the J. S. Harrington Company, Worcester, Mass., is now associated with the Palace Auto Company of the same city.

The Piedmont Motor Car Company, Charlotte, N. C., which was incorporated recently expects to open its new garage and repair shop in the near future.

The Elmer Automobile Company, Hartford, Conn., opened its new salesroom at Trumbull and Church streets, recently.

W. H. Vinal has closed a contract with the Pullman Car Company, York, Penn., for the eastern Massachusetts territory, and will assume the management of the Pullman department of the Boston Motor Car Company, Boston.

The California Automobile Company, Los Angeles, Cal., is occupying its new quarters at Seventh and Hartford streets. The salesroom has a frontage of 125 feet. Both gasoline and electric vehicles will be handled by the company, but in the garage these will be kept separately.

The Munger Auto Company, Dallas, Tex., has purchased a lot 50 by 100 feet on Commerce street, and will erect a model building to be used exclusively by the company. The structure will be three stories in height and will cost about $20,000.

William F. Goodwin has purchased the interest of Joseph Etchells in the Biddeford Motor Mart, Biddeford, Me., and will be sole manager of the business hereafter.

Hansen & Tyler, Webster City, Ia., announces the purchase of a large tract of land on which will be erected a new garage in the spring.

G. E. Carlson, Main street, Middletown, Conn., is enlarging a building on Church street which will be utilized for the storage of motor cars.

Kimmel Bros., 215 North Fourth street, Columbus, O., has taken on the Cole line in addition to the Speedwell.

The Wyoming Garage, C. H. Moulthrop, manager, Scranton, Penn., has been appointed agent for the Ohio car, made by the Ohio Motor Car Company, Cincinnati, O.

G. Pierce, a former Associated Press man, has joined the Colt-Stratton Company, New York City, and will take charge of the company's promotion department.

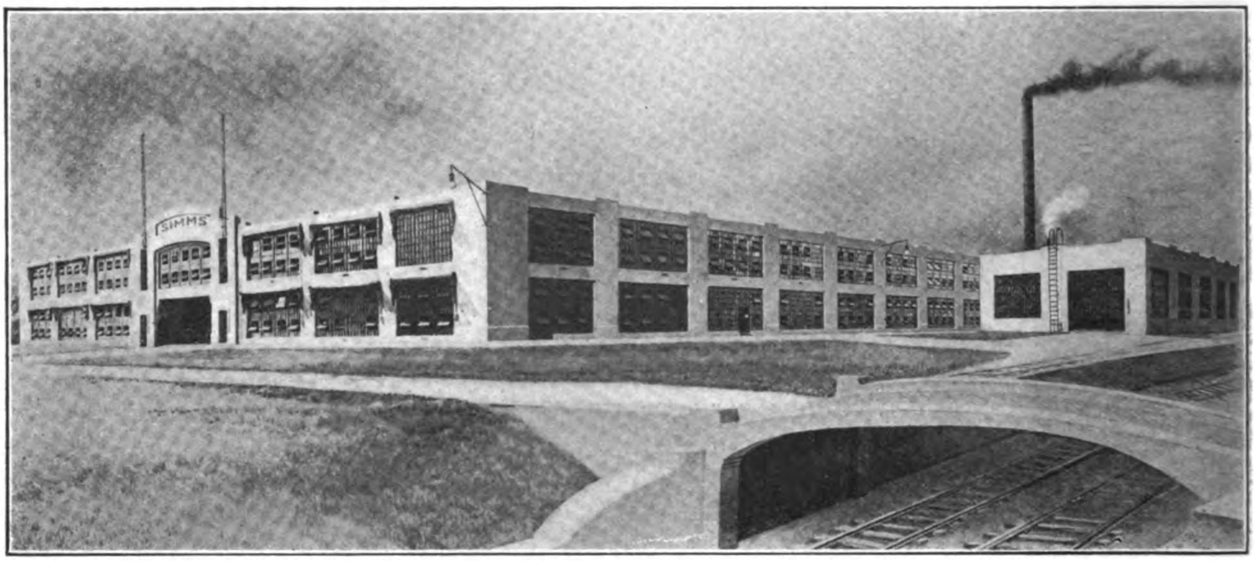
C. F. Cole, the head of the Cole Motor Car Company, Denver, Col., has made arrangements for the building of a new sales and service department on Auto Row.

J. R. McKinley & Co. has purchased the Estancia garage at Willard, N. M.

The Perry Automobile Company, Montpelier, Vt., has leased the new Martin garage completed recently and will represent the Ford line.

P. J. Clifford has assumed the management of the Crocker House garage at New London, Conn.

The Oskaloosa Garage Company, Oskaloosa, Ia., has been organized and will conduct a general garage business, also an automobile livery. Howard Taylor is president and E. L. Anderson, general manager.



View of the New Simms Magneto Factory, Located at Bloomfield, N. J., on the D., L. & W. Railroad, a Thoroughly Modern Building of Reinforced Concrete.

J. H. Van Closter, Kansas City, Mo., has been granted a building permit to erect a garage at 207-211 West 14th street. It will be constructed of reinforced concrete and will cost $20,000.

The American Motor Sales Company, Syracuse, N. Y., has taken on the Cole line, in addition to the American, and the concern will be known in the future as the American-Cole Motor Company.

Charles Bellin Sons' Company, Cincinnati O., is making extensive alterations and improvements to its salesrooms at Vine and 15th streets.

The White Motor Car Company of Cleveland, O., is making plans to erect a two-story brick and concrete building to be utilized as a garage and salesroom at Craig and Atherton streets, Oakland, Penn.

Peter Horn and Bernard Mimno, North Adams, Mass., have opened a garage in the Grew shop on Commercial street in that city.

The Waterville Motor Company, Waterville, Me., expects to occupy its new garage at Main street and College avenue shortly. The structure will cost $25,000.

The Boston branch of the Velie Motor Vehicle Company announces that a contract has been closed with Nelson A. Seymour to handle the Velie line of pleasure and commercial vehicles in South Lancaster, Mass.

The Kerosene Gas Producer Company, whose plant is at Long Island City, N. Y., announces the opening of a sales office at 1926 Broadway, New York City, and requests that all communications in reference to its product be sent to that address.

WITH THE MANUFACTURER

The Boston branch of the Velie Motor Vehicle Company, Moline, Ill., will be represented at the New York show by Harold D. Bornstein, manager; James Coggeshall, New England travelling representatiye, and Lin McKie, manager of the commercial department.

Cole Agencies appointed recently are as follows: Savannah, Ga., M. A. Hayn; Red Bluff, Cal., F. W. Decker; Sacramento, Cal., E. C. Smitton; Stockton, Cal., Novelty Garage; Watsonville, Cal., E. B. Gilbert; Dixon, Cal., J. A. Spates; Colusa, Cal., Wood Yerxa; San Bernardino, Cal., E. A. Levreau; Youngstown, O., Ralph P. White; Freeport, Ill., D. E. Sunderland; Collins, Miss., W. R. Holloway; Urich, Mo., Robert McCoy.

J. H. Newmark, for four years advertising manager of the Oakland Motor Car Company, Pontiac, Mich., has resigned that position, having been advanced by the General Motors Company to the advertising department of the parent organization in Detroit, where he assumed his new duties recently.

The Ohio Motor Car Company, Cincinnati, O., in addition to showing a full line of 1912 models at New York will exhibit at Chicago and Boston.

The Moon Motor Car Company, St. Louis, Mo., recently added another floor to its building at Main and Douglass streets to increase its capacity for the manufacture of automobiles and supplies.

The Randolph Motor Car Company of Flint, Mich., has been sold by the General Motors Company to Eugene G. Goldman of Chicago. The latter owned the plant two years ago.

James F. Evans was appointed advertising manager of the Lozier Motor Company, Detroit, recently, succeeding C. A. Emise, who took the place of F. C. Chandler as sales manager. The latter is now general manager. Mr. Evans has become well and favorably known to the automobile industry and was at one time advertising manager of the Brush Runabout Company, Detroit.

The Haynes Automobile Company, Kokomo, Ind., occupies a plant covering an area of 7.5 acres of ground and the six buildings provide a floor space of 400,000 square feet. In the accompanying illustration is depicted the structures which are fire proof, being of concrete, steel and brick.

The Bright carburetor will be manufactured by a company incorporated at Indianapolis, Ind., composed of the following: S. M. Brundage, Ulric Z. Wiley, Clifford Arrick, Harry S. Rominger and Dr. C. E. Day. The vaporizer invented by Martin C. Bright has a gravity automatic feature which it is claimed will prevent flooding or choking the motor.

J. F. Gfrorer has been placed in charge of the Alco service department of the American Locomotive Company, New York City. Since joining the company he has been engaged in special work. He has been associated with the automobile industry since 1903, having filled several important positions for well known companies.

The Briggs-Detroiter Company, Detroit, a recently incorporated concern, has secured a factory plant comprising about two acres of ground north of Holbrook avenue in that city.

The Firestone Tire & Rubber Company, Akron, O., opened a direct factory branch at 1521 Commerce street, Dallas, Tex., Jan. 1. It will be under the management of P. B. Talbot, for many years a travelling salesman for the company.

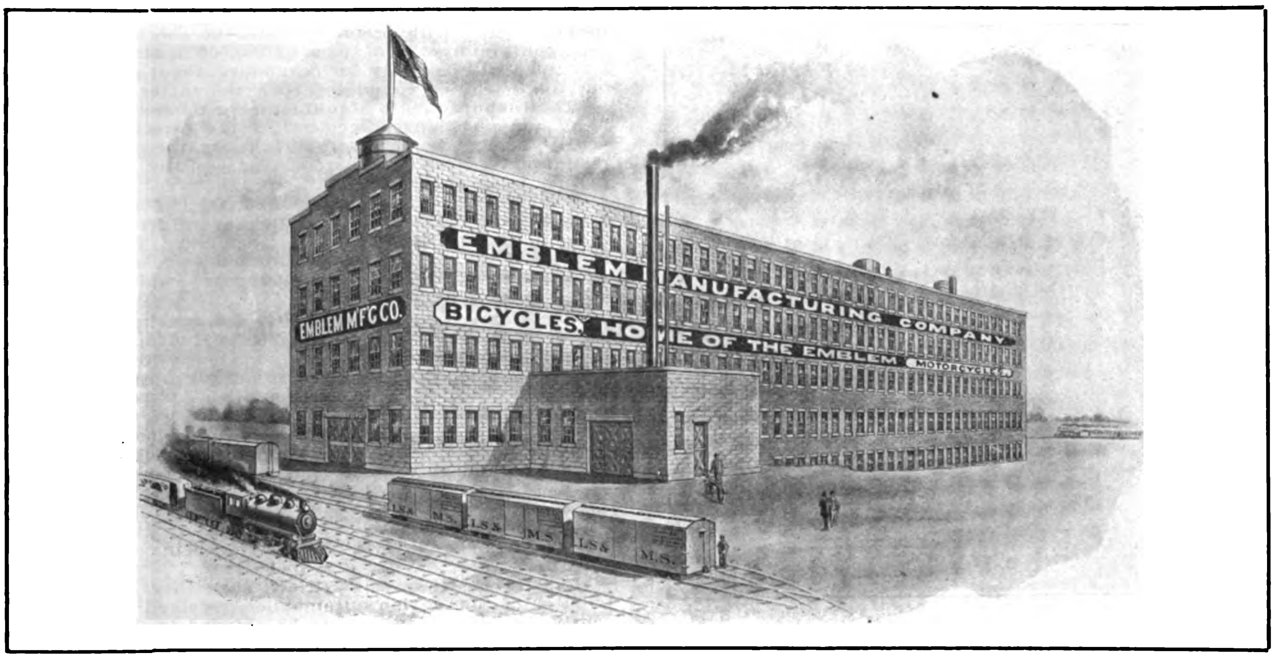
W. F. Byrket, formerly of the Newcastle factory of the Maxwell-Briscoe Motor Company, has been appointed manager of the Indianapolis, Ind., branch of the United States Motor Company, New York City. Thomas L. Marshall, who assumed charge of the branch temporarily, has been appointed assistant superintendent of the central sales district. The territory includes practically all of the central states.

The Hartford Suspension Company, Jersey City, N. J., has opened a factory branch at 1524 Grand avenue, Kansas City, Mo. Henry Riemer is manager.

C. E. Stebbins, head of the order department of the Studebaker Corporation's E-M-F factories, has been assigned to the management of the Sioux Falls, S. D., branch. His associates presented him with a handsome travelling bag upon his departure from Detroit.

The Auto Appliance Manufacturing Company, Akron, O., which is making a self-starting device for motor cars, and which was incorporated recently, has elected the following officers: President, J. W. Miller; vice president, J. A. Swinehart; secretary and general manager, A. Auble, Jr.; superintendent, C. W. Steele; sales manager, C. C. Walker.

The Remy Electric Company, Anderson, Ind., announces the opening of a service station at Dallas, Tex., where users of the Remy ignition devices will be taken care of. The department will be in charge of M. A. Price, formerly connected with the New York City branch.



Factory of the Emblem Manufacturing Company, Angola, N. Y., Where the Well Known Emblem Motorcycles Are Produced.

The Stuyvesant Motor Car Company, Cleveland O., has taken over the Grant-Lees Machine Company and a new $250,000 corporation has been formed to manufacture on a large scale the Stuyvesant, or rebuilt Gaeth car. Ground has been broken for a $65,000 building adjoining the plant of the Grant-Lees Machine Company, and 50,000 feet of additional floor space in the latter building will be utilized by the mechanical department. About 165 machinists and 200 others will be employed as soon as the new structure is completed. The new company expects to produce about 100 cars by July 1.

Albert H. Doolittle, advertising and publicity manager of the Knox Automobile Company, Springfield, Mass., has resigned his position. He is well known to the trade through a long practical automobile experience which has taken him through every step of motor car manufacture, distribution and advertising, so that his new venture as a specialist in this class of publicity will be followed with interest.

Grant L. Egan has resigned as advertising manager of the Motor Car Equipment Company of New York City and will devote his attention to a general advertising business under the name of the Catalog Publishing Company, World building, New York City.

The Premier Motor Manufacturing Company, Indianapolis, Ind., is publishing an eight-page paper called "The Motor News," in which is described and illustrated in an interesting manner the story of the ocean-to-ocean trip of the Premier cars, made recently.

The Velie Motor Vehicle Company's Chicago branch has appointed the Columbia garage, 335 West Madison street of that city, agent for the Velie pleasure and commercial vehicles. A service station will be maintained.

The Stewart & Clark Manufacturing Company, Chicago, maker of Stewart speedometers, announces an addition to its already extensive plant which is shown in the accompanying illustration. The new structure will cost $100,000, will be equipped with modern machinery and utilized for the manufacture of drop forged swivel joints.

The Penn Motor Car Company is building a plant at New Castle, O. The main building will be 60 by 510 feet and will have six wings, each 60 by 150 feet. These are to be completed by Jan. 10.

C. R. Dashiell, manager of the Milwaukee, Wis., branch of the Studebaker Company, has been transferred to the Chicago office, where he will have charge of the retail department.

J. H. Newmark, for the past three years advertising manager of the Oakland Motor Car Company of Pontiac, Mich., and formerly assistant manager of the Olds Motor Works, has been transferred to the advertising division of the General Motors office at Detroit.

B. F. Blaney, who was appointed sales manager of the Havers Motor Car Company of Port Huron, Mich., recently, is now in the East appointing agents for the Havers line. He was formerly general sales agent for the Johnson Service Company of Milwaukee, Wis.

The K-W Ignition Company, Cleveland, O., maker of the well known K-W ignition specialties, is occupying a new factory completed recently. The structure is fire proof throughout, being of steel construction with reinforced concrete. It is 75 feet wide and 165 feet long, and has over two acres of floor space. It will be utilized exclusively for the manufacture of K-W magnetos, spark coils, master vibrators and road lighting outfits. This large plant was necessary because of the great increase in the volume of business.

F. H. Quick, formerly with the Gibson Auto Company, Indianapolis, Ind., and the United Motors Company of the same city, has joined the sales force of the Findeisen & Kropf Manufacturing Company of Chicago, maker of Rayfield carburetors.

The Remy Electric Company, Anderson, Ind., which absorbed the American Electric Headlight Company recently, has purchased all patents, designs, etc., of the Peters Electric Headlight for steam locomotives. New buildings will be erected at Anderson to care for the increased production of the Peters lighting apparatus.

Albert F. Mais, formerly of the Mais Motor Truck Company of Indianapolis, Ind., and well known in motor car circles, has joined the staff of Walter E. Flanders at the Studebaker Corporation plants at Detroit as consulting engineer.

The Oakland Motor Car Company's plant at Pontiac, Mich., now comprises eight buildings providing 15 acres of floor space, as several additions were made recently. The company plans an output of 6000 Oakland cars for 1912 and at present 1200 workmen are employed. Eight different models are being manufactured.

H. A. Gilmartin, head of the moving picture department of the Studebaker Corporation, is back from Europe where he installed several sets of films, depicting the methods of building Flanders and E-M-F cars.

Clifton C. Edwards has been made manager of the Boston branch of the Marquette and George Lighthall will represent the sales department.

The Moline Automobile Company has opened a branch at Omaha, Neb., at 20th and Harney streets. D. M. Beal is manager.

Louis Hendon has been appointed assistant superintendent to George Schuster in the service department of the Thomas Motor Company of New York City.

The Matheson Automobile Company, Wilkesbarre, Penn., will open a completely equipped service bureau in Boston. The building is located on Commonwealth avenue and the department will be in charge of Roy A. Faye.

The Hudson Motor Car Company, Detroit, Mich., expects to occupy its new factory shortly. The new structure adjoins the east end of the plant, is 530 by 60 feet and two stories in height, and constructed of steel and concrete. It will afford an increase of 63,000 square feet of floor space.

G. S. De Lany, formerly with the Stevens-Duryea Company, has entered the employ of the Matheson Automobile Company as factory manager and will be in direct charge of the production department.

E. P. Horton, who was recently appointed manager of the United Motor Atlanta Company, Atlanta, Ga., southern branch of that division of the United States Motor Company, New York City, was formerly manager of the company's branch in Syracuse, N. Y.

The American-Marion Sales Company, New York City, which handles the Marion and American cars, is established in commodious quarters at Broadway and West 63rd street. In the illustration appended herewith is shown the four-story building which houses the product of the American Motors Company, Indianapolis, Ind., and Marion Sales Company of the same city.

AMERICAN MARION SALES CO.

Handsome and Commodious Quarters of American-Marion Sales Company New York City.

A. R. Rousseau, well known to the automobile industry, has been appointed western sales manager of the Imperial Motor Car Company, Jackson, Mich., with headquarters at 2216 Michigan avenue, Chicago. He was formerly connected with the executive forces of the General Motors Company.

The Maytag-Mason Automobile Company, Waterloo, Ia., has been reorganized and will be known in the future as the Mason Motor Company. The business will be conducted by H. W. Hayden, W. B. Wallace and E. R. Mason.

The Studebaker Corporation, Detroit, announces the appointment of Philip E. Hawley to take charge of the New England business of the concern. Mr. Hawley, who is well known to the automobile trade, will make his headquarters at Boston, where he will have entire charge of the wholesale business for this section.

The Henderson Motor Sales Company, distributor for the Cole Motor Car Company, Indianapolis, Ind., has appointed the following new Cole agencies for the State of New York: Peterman Motor Sales Company, Jamestown; R. L. Cooley, Batavia; William R. Hopkins, Bath; North Avenue Garage, Fiskkill-on-the-Hudson; J. Harry Cook, Cooperstown; Dewar & Diefendorf, Oneonta.

The Velie Boston Branch of the Velie Motor Vehicle Company, Moline, Ill., announces that Amos J. Shorey will handle Velie pleasure and commercial vehicles in Waterville, Me. Tucker & Palmer of Tarrifville, Conn., will act as sub-agent for the J. T. Curtiss Company of Simsbury, Conn., Velie representatives in western Connecticut.

The Pacific Coast Borax Company, 100 William street, New York City, is marketing a product for both chauffeur and owner called "Grime-off." It is made in powder form and packed in a convenient can fitted with a sifting top, a sanitary feature which will appeal to users.

The Connecticut Telephone & Electric Company, announces the opening of an office, stock and show room at 231 West 54th street, New York City, where a complete stock of Connecticut ignition devices will be carried.

Ernest L. Gould, superintendent of the service department of the Velie Boston branch, left recently for a visit to the factory at Moline, Ill. He will visit the Chicago branch while en route.

The Ohio Motor Car Company, Cincinnati, O., announces that Breisario E. Diaz of Cartegena, Colombia, South America, who visited the factory recently, will handle the Ohio line in his country.

D. Kirke Moore, formerly of Buffalo, N. Y., has accepted the position of general sales manager of the Western-Mott Company, Flint, Mich., but will retain his interests in the American Distributing Company. He is well known to the automobile industry having been engaged in the manufacture and sale of axles, wheels, transmissions and steering gears.

The Colby Motor Company, Mason City, Ia., will enlarge its factory and increase the number of workmen, according to an announcement made by the officers of the company.

The Stevens-Duryea Company, Chicopee Falls, Mass., has decided to begin the construction of a new plant and has acquired 40 acres of land in East Springfield, Mass., located on the Athol branch of the Boston & Albany railroad and the new Hampden branch of the New York, New Haven & Hartford line. The first building to be erected will be four stories in height, 500 by 80 feet, containing a floor space of 160,000 square feet. This structure will be ready for occupancy about June 1. Other buildings will be completed soon thereafter.

The Cleburne Auto Manufacturing Company, Cleburne, Tex., announced at a meeting of the directors held recently that prospects were bright, as the first machine manufactured had withstood successfully a thorough testing under varying conditions.

The White Company, Cleveland, O., has established a large agency in Buenos Ayres and several sub-agencies in other parts of the Argentine Republic. The company is pleased with the prospects for commercial vehicles in place of the primitive methods now employed on the large coffee and sugar plantations.

The Maxwell-Briscoe Motor Company's immense plant at Tarrytown, N. Y., is located on the Hudson river which body of water froze recently sufficiently to permit the use of ice boats and motor cars. Testers at the factory took advantage of this to try out the Maxwell cars. The smooth surface of the ice permitted of great speed and the drivers thoroughly enjoyed the novel conditions.

The Cole Motor Car Company, Indianapolis, Ind., subjects each and every Cole chassis to a severe test before the body is fitted and the machine painted. In and around the city the small army of testers may be seen daily driving their automobiles over the worst kind of roads, some of which are soft clay. After being tried out on the roads they are given a speed test.

Charles E. Riess & Co., New York City, general distributor of the Marion automobiles, received an order recently for 10 Marion cars to be shipped to South Africa.

Harry D. Miller, formerly of the Bridgeport Vehicle Company, has joined the sales force of the Blue Ribbon Garage Company, Bridgeport, Conn.

The Howard Automobile Company, Los Angeles, Cal., has opened its new warehouse at 1701 San Fernando street. The building has 10,000 square feet of floor space, a private driveway and spur track for loading platform, and will be equipped for quick handling of automobiles.

Edward Wells, Boston, who for three years has been connected with the E. R. Thomas Motor Car Company, both in Boston and Buffalo, has severed his connection therewith. He was assistant sales manager of the Thomas factory prior to his going to Boston.

The Ford Times, a monthly publication devoted to the interests of the Ford Motor Company, Detroit, has in its January number, an instructive article dealing with putting the model T car away for the winter.

Alden McMurtry announces that he has resumed the manufacture of the McMurtry mechanical horn which he states is the result of nine years experimental work.

C. L. Clark, formerly with the Driggs-Seabury Ordnance Corporation, and the Kelly Motor Truck Company, has joined the laboratory staff of the New Departure Manufacturing Company, Bristol, Conn., maker of ball bearings. Mr. Clark is a metallurgical engineer and graduated from the Case School of Applied Science at Cleveland, O., also the Ohio State University.

The Henderson Bulletin, a publication devoted to the interests of the Henderson Motor Sales Company, Indianapolis, distributor of the Cole line, contains in the February issue, a number of interesting illustrations in which Cole automobiles are prominent.

The Firestone Tire & Rubber Company, Akron, O., is issuing to the trade a very handsome wall calendar which is printed in colors.

WHAT LIMITS YOUR PROFITS?

Conditions That Generally Obtain and Militate Against Efficient Service and Satisfaction of Patrons—What Forms of Car Demonstration Pay?

It is a custom with those who propose to purchase motor vehicles to demand demonstration. With some this purpose is to carefully observe the operation of the machine under differing conditions. With others it is merely a pretext to ride as far as is possible without protest from the operator. Naturally no person having a prospective buyer with him cares to cause offense, and for this reason men whose patience has been exhausted have endured decided imposition rather than speak in just protest. The enthusiasm of the salesmen, who want to make sales, has often resulted in long rides with loss of time and considerable expense to the agent.

There are those careful and cautious buyers who exact tests that they would not attempt with their own property, but these are comparatively few. Those who have had experience with cars understand better than those who are "shopping" for their first machine. One might similarly classify the men and women who go about and ask that they be "shown" and, strange as it may appear, those who have the most knowledge desire the least exhibition work.

Most agents must please their callers. This cordiality often leads to assumption. The supposition is that driving must be pleasure to the dealer or the salesman and that either is willing to go anywhere and at any time. Few realize that there is material expense aside from the loss of time in taking a caller a few miles over the road.

Some representatives are more business-like. They have fixed times for demonstration and the time limit for each trial is necessarily established. They have stated times when the car, clean and well groomed, is displayed in the salesrooms, and they find that it is just as necessary to have it seen to good advantage as it is to show its capacities. So far as their own service is concerned they believe that as a matter of business the car they might use could be utilized to better result.

There are others who depend to a considerable extent upon their personality and good fellowship to bring them sales. It is natural enough that those who are included in this class must be as liberal in their entertaining as are those they do business with, and profitable transactions are the exception rather than the rule.

Another group believe that it is wise to make careful mechanical explanation of the construction of machines, a policy that is admirable when dealing with those versed in mechanics, and absolutely bewildering when the inquirer has little or no mechanical knowledge.

It is realized that every possible customer's ideas are different and needs widely differ, but there are certain well established policies or principles that can be applied or adapted to the conditions obtaining with nearly all car sales agencies.

This subject is decidedly important to all those engaged in selling cars. For the purpose of obtaining expressions from readers the editor of the ACCESSORY and GARAGE JOURNAL invites contributions approximately of 600 words which will be published at convenience. For the three most meritorious, $5, $3 and $2 will be paid respectively. Articles should be submitted within 30 days to "Demonstrations," the ACCESSORY and GARAGE JOURNAL. The names of those whose articles have been approved will be published in the April issue.

HOW ADVERTISING MATTER SHOULD BE DISTRIBUTED?

There is not a garage, salesroom, or office that does not in the course of a year receive printed advertising literature. Some of this is cheap and some is expensive, some is of standard lines and well known articles, some is of new products, some is of motoring necessities and some of what will convenience the automobilist. It is not possible to estimate even for illustration the total commercial value of such advertising matter, but while this is a factor so far as those who issued it are concerned, the real subject is the actual results to be obtained by careful and systematic distribution.

Publicity as originated in booklet, folder or other form has certain value if it reaches the people who might be interested. The matter is sent to those handling the line it explains or promotes and it is assumed that distribution is made by the dealer or agent. This is admirable in theory but under any circumstances there is a great waste and loss through carelessness and neglect, and often literature of special merit is set aside with no endeavor made to secure the business it might create and attract.

It is a fact that in the attention to other things regarded as more important the advertising is overlooked. This is a loss to all who might benefit, and business building is retarded when it might be stimulated. This applies to all alike but the larger the volume of transactions the greater the possibilities for expansion. In many stores and offices one may frequently see stacks of booklets and folders, neatly piled and perhaps covered with dust, which are abolutely worthless unless placed in the hands of an interested person. These might or might not be mailed, but this is an expense not often approved and the advertising is accumulated until an enterprising junkman carries it away.

The systematic distribution of such literature does not suggest itself to the average man. He regards the printed matter as something to be tolerated for a while and then tossed into the waste. Not a thought is given to the possibilities if the advertising were utilized. No one is instructed to hand to every visitor a booklet or folder and to call attention to the merit of the article it illustrates or describes; nor is it believed wise to mention that these are carried in stock or are secured to order.

There are numerous methods for using the advertising so as to directly benefit one, and to supplement the advertising campaigns which may be undertaken by the manufacturer or jobber from time to time, instead of permitting the literature to lie dormant and lose its value. There is a responsibility placed upon every person directing a business and where publicity can be obtained and utilized it is strange indeed that it is not always employed to advantage.

The editor is desirous of obtaining the views of readers of the ACCESSORY and GARAGE JOURNAL in the form of articles of not more than 600 words each, and for the three most meritorious will pay $5, $3 and $2 respectively. These articles should be submitted to "Publicity in the Store," the ACCESSORY and GARAGE JOURNAL, within 30 days. The names of those who articles have been approved will be announced in the April issue.

Read Great Money Making Agency Proposition on Pages 45, 46, 47.

HOW SHOULD REPAIR WORK CHARGES BE ESTABLISHED?

One of the most perplexing problems that presents itself to the owner and manager of the repair shop is the demand generally made by a customer that an estimate be given of repair cost before work has been begun and the true condition of the car learned by careful examination. It is well enough for the car owner to ascertain the total of any expense he is contracting, but it is also impossible to be truthful and accurate until work has actually progressed to dismantling, at least.

When the full extent of the repair is known some of the items could be definitely stated, but as there is generally a probability of discovery of other needed work if the machine is to be fully restored actual expense can seldom, if ever, be fairly determined. It would be unreasonable, and might be regarded as neglect, were a repairer to refuse to give attention that were needed, and yet an owner cannot always be convinced that his car has worn without his knowledge.

In any repair service the work cannot always be correctly estimated. The time required for obtaining a special part or fitting is always uncertain, and obstacles may be met with that will seemingly prolong the labor performed. There is a possibility that if estimate were made the figures would be more than the actual expense that might be incurred and the customer would be required to pay unnecessarily if the estimated price were exacted.

Where a work is taken on the basis of an uncertain price the repairer must charge enough to insure his own profit, and that there is a disposition to protect one's self cannot be denied. If the work is "shopped" and the owner accepts a price fixed as covering everything required he may be misled, because the one estimate may not include as complete service as another, and of course the total does not represent satisfaction.

It is assumed, of course, that the repairer is doing honest work. There is no intention of reflecting upon the business methods of any person, but it is meant that the owner is satisfied he is not being imposed upon. There are instances, however, where charges have been made for work that from every angle appear unreasonable and cannot be satisfactorily explained.

It is certain enough that the conditions stated will always obtain and as human nature cannot be changed it would be well for both repairer and customer if a recognized system or method of handling work could be devised. The subject is decidedly important and for the purpose of ascertaining the opinions of those who may have experience the editor invites them in written articles of not more than 600 words, which should be submitted to "Repair Shop Methods," the ACCESSORY and GARAGE JOURNAL, within 30 days. For the three most meritorious $5, $3 and $2 will be paid respectively. The names of those whose contributions have been approved will be published in the April issue.

HOW SHOULD POWER WAGONS BE MAINTAINED?

The increasing use of power wagons has developed a condition that must be met by changed methods. Where one machine may be in service it is well within the capacity of the operator to make adjustments and small repairs outside of the regular working hours, but where several vehicles are used the essential inspection and attention entails work that cannot be expected of the drivers if the desire is to uniformly maintain the machines. In connection with any haulage enterprise it is desirable that the transports be under the observation of as good a mechanic as can be consistently employed, and naturally responsibility must be established, which means that there must be a head. If the drivers serve without instruction there can be but indifferent results.

Where there is a comparatively small number of machines it may be possible for the owners of two or more equipments to combine a garage service, a competent mechanic and helper being employed to inspect the wagons at the conclusion of each day's work, make whatever adjustment and repairs are necessary and have them ready for service. Such a proposition may have a measure of economy, but it also has an element of inequality in that the condition of the cars depends to a considerable extent upon the character of drivers, and obviously the work on them will differ considerably. If it is believed that there will be an average work required on each there may be satisfaction with such a proposition, but this result is not always a probability.

Some men have found it advisable to store their power wagons in a first class garage, paying for a certain inspection and adjustment each night and a general examination Sundays. Others have believed it well to leave the attention as well as the operation to the drivers, and others have been disposed to leave all of the maintenance in the hands of the agent, or as much as he will engage to care for.

The supposition is that with the one or two machines it may not be economical to have the separate garage and exclusive attention, but there is no question that where there is a sufficient number of automobile vehicles this character of service is decidedly the better. There is a point, however, where the economy of the one method ceases and the other is begun. While it is true that conditions may vary to a considerable degree and experiences may differ broadly the knowledge that will obtain through consideration of the subject cannot be otherwise than decidedly helpful. With the purpose in mind of causing discussion of the proposition and developing from experiences what may benefit those who have to deal with such a problem, the editor invites written contributions relating to it of not more than 600 words, these to be submitted to "Power Wagon Maintenance," the ACCESSORY and GARAGE JOURNAL within 30 days. For the three most meritorious of these articles $5, $3 and $2 will respectively be paid. The names of those whose contributions have approval will be announced in the April issue.

May Remove to Warwood, W. Va.

Negotiations well nigh completed by representatives of the Board of Trade of Wheeling, W. Va., and the Hercules Tire & Rubber Company, Pittsburg, Penn., contemplate the removal of the company to Warwood, near Wheeling, where a factory and facilities for manufacturing are available.

Mansfield Company Is Reorganized.

The Mansfield Tire & Rubber Company, with capital of $300,000, has been organized by B. L. Chase, who was president of the Mansfield Rubber Company, Mansfield, O., to succeed to the business of the original company. Associated with Chase as incorporators are Walter F. Heene, George W. Heene, C. R. Grant and F. M. Bushnell.

A bronze alloy known as Littand bronze, which can be worked when heated and has six times the strength of bronze or brass is to be produced by the Littand Manufacturing Company, Kenosha, Wis., which concern is composed by A. Littand, president; Charles Anderson, vice president; William Anderson, secretary, and George Fisher, Jr., treasurer.

FROM EVERY POINT OF VIEW.

Will Form Indiana Branch S. A. E.

An Indiana branch of the Society of Automobile Engineers is to be formed with headquarters at Indianapolis, where about 40 of the 80 members of the national society reside.

Look for General Cut in Tire Prices.

It is expected that a number of the tire manufacturers will follow the example of the Michelin Tire Company which has announced a reduction of prices for standard shoes and tubes which approximates 10 per cent.

Prest-O-Lite to Stay at Indianapolis.

The Prest-O-Lite Company has been authorized by an ordinance passed by the city council of Indianapolis, Ind., to locate a plant within the city limits, subject to certain conditions, and is now seeking a site. This precludes the removal of the gas manufacturing and assembling plant from Indianapolis, which was stated to be determined before the passage of the ordinance. The company has a plant about five miles south of Indianapolis, which it will probably continue to utilize.

Madison Square Garden Show After All.

The F & D Company has taken title to the Madison Square Garden property, this being transferred by the Madison Square Garden Company, the owner of this noted metropolitan exhibition building. It is stated that there is no immediate prospect that the structure will be demolished, but possibly in another year the Madison avenue end will be destroyed and replaced by office buildings. So far as is known this means that the tower and that section housing the arena will be continued as they now are and will be available for shows and exhibitions.

Indiana Manufacturers Elect Officers.

The Indiana Automobile Manufacturers' Association has elected these officers: President, Frank E. Smith of the Maxwell-Briscoe Motor Company, Newcastle, Ind.; vice president, Will H. Brown of the Mais Motor Truck Company, Indianapolis; secretary, J. M. Ward of the Waverley Company, Indianapolis; treasurer, Fred N. Coates of the Lexington Motor Car Company, Connersville, Ind.; directors, George M. Dickson of the National Motor Vehicle Company, H. H. Rice of the Nordyke & Marmon Company, and E. M. McMorris of the Great Western Motor Car Company, Peru. The association is considering the organization of a tour by motor wagons that will traverse about 1500 miles and visit many of the principal cities and towns in Indiana, Ohio, Kentucky and Pennsylvania.

CHANGES WITH GOING CONCERNS.

Post & Lester Company's Broad Charter.

Through an amendment to its charter filed at Hartford, Conn., the Post & Lester Company, of that city, is authorized to manufacture and sell goods of all kinds.

P. H. P. Becomes Westfield Company.

The P. H. P. Motor Truck Company, Westfield, Mass., has been succeeded by the Westfield Motor Truck Company, which organization is headed by M. J. Macgill, who with others is interested in the Atlantic Motor Truck Company, New York, N. Y. The Westfield vehicles range from 1000 pounds to two tons capacity.

Lansden Not in International.

There is no connection whatever between the International Motor Company, which is the consolidation of the Mack and Saurer companies, and the Lansden Company, maker of electric service wagons, which concern was recently purchased by interests represented by W. L. Case of the Mack Bros. Motor Car Company.

Pope Company to Change Charter.

Preparations are making for the dissolution of the Pope Manufacturing Company as organized under Connecticut laws and its incorporation under Massachusetts law, this to be done to insure to the Massachusetts stockholders, who are in the majority, certain advantages in exemption from taxation in Massachusetts, which exemption does not include corporations organized under the laws of other states.

New McAdamite Factory at Detroit.

The United States McAdamite Metal Company, Brooklyn, N. Y., manufacturer of metal products, has purchased a site at Isabella avenue and E street, Detroit, Mich., on which it will erect a one-story steel and concrete building 90x150 feet as a branch factory.

Swetland Is Chairman.

Having acquired a substantial interest in the concern H. M. Swetland, formerly president of the Class Journal Company, has been elected chairman of the board of directors of Wyckoff, Church & Partridge. This company has the sales agency for the United States for the Commer trucks, and is now manufacturing the machines in this country under license from the English company.

Will Establish Town and Plant.

A town to be known as Appleby is to be established near Davenport, Ia., by the Western Implement and Motor Company, which recently acquired control of the Colby Motor Company of Mason City, Ia., where a tract of 80 acres of land has been bought on which it is planned to build seven factory buildings, two storehouses and three 100,000 gallon tanks for storing water, gasoline and fuel oil. The buildings are to be one story, save the office, which will be two stories, of reinforced concrete, and will be of sawtooth roof design. One building is to be 1000 by 80 feet.

SEEKING SITES FOR FACTORIES.

Grand Rapids Wants Hoosier Company.

The Association of Commerce of Grand Rapids, Mich., is endeavoring to raise $100,000 to secure the location of the Hoosier Limited Truck Company in that city.

Ford Factory at Los Angeles.

If the policies of the Ford Motor Company are not changed a branch factory of considerable proportions will be built on the Pacific Coast, probably at Los Angeles, Cal., from which it would be possible to distribute cars to the states west of the Rocky Mountains, to Hawaii and the various Asiatic countries.

Fishback Company Wants Factory Site.

With an authorized capital of $3,000,000 the Fishbach Motor Company, Newark, N. J., is seeking a site for a factory and announces its intention to begin the construction of a plant by June 1. Overtures have been made to bodies promoting local industries in several cities.

Lauth-Juergens Branch at Gibsonburg.

The Lauth-Juerbens Motor Car Company, Fremont, O., has completed plans for the establishment of a branch factory at Gibsonburg, O., and is also to enlarge its Fermont establishment.

Receiver Controls New Albany Concern.

The New Albany, Ind., Trust Company has been appointed receiver of the American Automobile Manufacturing Company of that place at the petition of several stockholders who maintain that control by a court is necessary for the protection of their interests, although they maintain the assets largely exceed the liabilities. Several suits instituted by holders of stock revealed conditions which threatened the disruption of the concern, and some who were considerably interested decided upon the course taken.

Read Great Money Making Agency Proposition on Pages 45, 46, 47.

ACCESSORY MAKERS MEET.

The annual meeting of The Motor & Accessory Manufacturers held at New York City recently was unusually well attended. In his annual report, President H. T. Dunn announced that the membership had been increased to 251. The following were re-elected as members of the board of directors to serve for three years: H. T. Dunn, Fisk Rubber Company; L. M. Wainwright, Diamond Chain & Manufacturing Company; E. S. Fretz, Light Manufacturing & Foundry Company. F. C. Billings, Billings & Spencer Company, was elected to succeed F. E. Castle. The new office of assistant treasurer also was created.

The election of officers resulted as follows: President, H. T. Dunn; first vice president, James H. Foster; second vice president, C. E. Whitney; third vice president, Claire L. Barnes; secretary and assistant treasurer, L. M. Wainwright. The following committees were appointed by the president:

Show and allotment: D. J. Post, H. E. Raymond, C. T. Byrne, James H. Foster, F. C. Billings.

Finance: James H. Foster, H. E. Raymond, C. T. Byrne, W. H. Crosby.

Traffic: D. J. Post, Claire L. Barnes, George Baum.

Membership: L. M. Wainwright, C. E. Whitney, T. J. Wetzel.

CHANGES AMONG THE TRADE.

Steenrod to Make Spark Plugs.

George Steenrod is the head of the Steenrod Auto Supply Company, which has begun the manufacture of spark plugs at Wheeling, W. Va.

De Long Joins Apple Company.

R. B. De Long, formerly with the Dayton Motor Car Company, has been engaged as manager of production for the Apple Electric Company, Dayton, O.

Neighbors Is Hupp Sales Manager.

R. G. Neighbors is now sales manager of the Hupp Motor Car Company, Detroit, Mich., a position which he filled from the appointment of C. D. Hastings to the general managership of the company several months since.

Smith Leaves Metzger for R-C-H.

After a service of a year with the Metzger Motor Car Company, Detroit, Mich., and previous to that five years with the Packard Motor Car Company, Walter R. Smith has been made chief accountant of the R-C-H Corporation.

Bailey Active in Abbott Company.

Clayton E. Bailey is now an active element in the Abbott Motor Company, Detroit, Mich., in which he is heavily interested, he having resigned as president of the Bailey Table Company, Jamestown, N. Y., to remove to Detroit.

Wilson to Head Warren Interests.

L. E. Wilson is to succeed J. G. Bayerline as vice president and general manager of the Warren Motor Car Company, Detroit, Mich. He was formerly secretary of the Detroit Board of Trade, from which position he recently resigned.

Hewitt Is Northway Superintendent.

The production of the Northway Motor & Manufacturing Company, Detroit, Mich., is superintended by G. H. Hewitt, formerly chief inspector for the F. B. Stearns Company, Cleveland, O., and before that for six years superintendent of the Garford Company, Elyria, O.

Carter Motor Car Corporation Fails.

Wilton J. Lambert and A. Gary Carter are receivers for the Carter Motor Car Corporation, Washington, D. C., with a factory at Hyattville, Md., a concern that has existed for about eight years and has during that time marketed but few machines. The first machine built was known as the Carter, which was equipped with two engines, but the Washington, the latest vehicle, was conventional

Bennett Making Good Recovery.

The climate of Florida, where he recently went to combat an illness that prevented the use of his vocal organs, has been so beneficial to George W. Bennett, vice president and general sales manager of the Willys-Overland Company, that he expects to return to Toledo, O., early in March well advanced toward complete recovery.

United States Tire Managers Change.

Joseph C. Weston, manager for the western district of the United States Tire Company at San Francisco, Cal., has succeeded to the management of the central district of the company's organization, with headquarters at Chicago, replacing A. I. Philp, resigned. Mr. Weston's former position has been filled by C. A. Gilbert, who was assistant manager of the eastern district with headquarters in New York.

Pelletier Handling Universal Copy.

In addition to his duties as advertising manager of the Studebaker Corporation and the Flanders Manufacturing Company, E. LeRoy Pelletier has assumed the conduct of similar work for the Universal Motor Car Company, Detroit, Mich., which concern may be merged with the Flanders Manufacturing Company, negotiation to accomplish this now being in progress.

Federal New Plant Occupied.

The Federal Motor Truck Company, Detroit, Mich., has practically completed the removal from the old factory to the plant of the Van Dyke Motor Car Company, which was recently acquired. The structure is modern in every respect and there is abundant room for expansion. The plant has a capacity of about 1000 trucks a year.

Beaver Brings Out New Model.

A new model Beaver, four cylinders, with bore of 3.25 inches and stroke of five inches, has been placed in the market by the Beaver Manufacturing Company, Milwaukee, Wis. The cylinders are cast en bloc, which is a departure from the practise obtaining with the other engines produced by this company.

Will Build New Goodyear Branch.

To replace the branch that was recently destroyed by fire at Detroit, Mich., the Goodyear Tire & Rubber Company will erect a new structure especially designed for the needs of the business. The loss suffered with the burning of the building was approximately $160,000.

Cleveland Company May Buy Plant.

The Cleveland Motor Truck and Manufacturing Company, Cleveland, O., has made a proposal to the Howard Motor Company, Galion, O., for the purchase of the plant of the latter concern, and if it is accepted the factory may be continued as a branch.

Akron May Secure Ideal Company.

Negotiations are progressing between representatives of the Ideal Commercial Car Company, Detroit, Mich., and Akron, O., capitalists, which have as an object the removal of the concern to Akron provided a sufficient investment is made to justify this change. It is proposed, if the deal is made, to materially increase the producing capacity of the company's works.

R-C-H Corporation Increases Capital.

The capital of the R-C-H Corporation, Detroit, Mich., has been increased from $800,000 to $1,000,000 and the several interests represented by the concern are included in the corporation. Plans are made to produce 10,000 R-C-H cars and 1000 Hupp-Yeats electric cars for the present season. The works of the corporation will be considerably expanded with the advent of propitious weather.

Read Great Money Making Agency Proposition on Pages 45, 46, 47.

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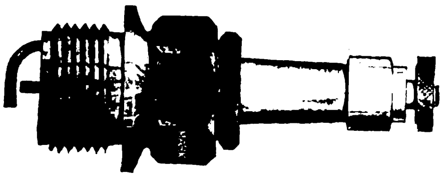

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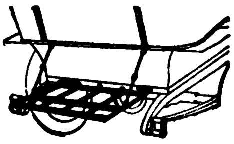

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Branch: 113 Massachusetts Ave., Boston, Mass.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass.

Hopewell Brothers, Newton, Mass.

Branch: 1974 Broadway at 67th St., New York City.

Miller, Chas. E., 97-103 Reade St., New York City.

Branches: 202-204 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York City; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia, Penn.; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence, R. I.

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Prest-O-Lite Company, 271 East South St., Indianapolis, Ind. (Prest-O-Lite.)

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New Departure Mfg. Co., Bristol, Conn.

BATTERIES — ELECTRIC STORAGE.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

Willard Storage Battery Co., Cleveland, O. (L B A.)

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National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

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Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)

Branches: 903 Boylston St., Boston, Mass.; 237 Lafayette St., New York, N. Y.

BRAKES FOR PLEASURE AND COMMERCIAL CARS.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARS—GASOLINE PLEASURE.

Abbott Motor Co., 605 Waterloo St., Detroit, Mich. (Abbott-Detroit.)

Atlas Motor Car Co., 104 Birnie Ave. Springfield, Mass. (Atlas-Knight.)

Branch: N. E. corner Broadway and 64th St., New York City.

Berkshire Motors Co., Cambridge, Mass. (Berkshire.)

Brush Runabout Co., 3 West 61st street, New York City. (Brush runabout, Liberty-Brush.)

Buckeye Mfg. Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)

Cole Motor Car Co. See Henderson Motor Sales Co.

Columbia Motor Car Co., 3 West 61st street, New York City. (Columbia.)

Dayton Motor Car Co., 3 West 61st street, New York City. (Stoddard-Dayton.)

Ford Motor Co., Detroit, Mich. (Ford.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Sales Co., Indianapolis, Ind. (Cole.)

Eastern Distributors: Colt-Stratton Co., Broadway at 68th St., New York City.

Herreshoff Motor Co., 620 Harper Ave., Detroit, Mich. (Herreshoff.)

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)

Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis, Ind. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Inter-State Automobile Co., Dept. N, Muncie, Ind. (Inter-State.)

Branch: 153 Massachusetts Ave., Boston, Mass.

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.)

Marquette Co., The, Detroit, Mich. (Marquette.)

Branches: New York City, Chicago, Boston.

Maxwell-Briscoe Motor Co., 3 West 61st street, New York City. (Maxwell.)

Michigan Buggy Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis, Ind. (National.)

Oakland Motor Car Co., 1300 Oakland Ave., Pontiac, Mich. (Oakland.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)

Branches: 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

R-C-H Corporation, 107 Lycaste St., Detroit, Mich. (R-C-H.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

BUYERS' GUIDE---Continued

Sampson Mfg Co., Alden, 3 West 61st street, New York City (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit, Mich. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st street, New York City. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Available Truck Co., 2334 Hamilton Ct., Chicago, Ill. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st street, New York City. (Brush.)

Cartercar Co., Pontiac, Mich. Cartercar.)

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg Co., Alden, 3 West 61st street, New York City (Sampson.)

Standard Motor Truck Co. of N. E., 9-11 Harcourt St., Boston, Mass. (McIntyre.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st street, New York City. (Sampson, Brush, Stoddard.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit, Mich.
Branches: See Cars, Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg Co., Alden, 3 West 61st street, New York City (Sampson.)

United States Motor Co., 3 West 61st street, New York City. (Sampson.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CARS—STEAM, COMMERCIAL.

American Steam Truck Company, Lansing, Mich. (American.)

CHAINS, TIRE.

Weed Chain Tire Grip Co., 28 Moore St., New York City. (Weed.)

CHAINS — TRANSMISSION OR DRIVING.

Hoffnung & Co., S., Ltd., 118 Broad St., New York City (Coventry.)

Miller, Chas. E., 97-103 Reade St., New York City (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES — AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CONNECTORS AND TERMINALS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tanks for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

GAUGES, ETC.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Tire Pressure and Gasoline Tank Gauges.)
Branches: In all principal cities.

HORNS—BULB, ELECTRIC, EXHAUST.

Automobile Supply Mfg. Co., 220 Taaffe Place, near DeKalb Ave., Brooklyn, N. Y. (Newtone.)

Randall-Faichney Co., Boston, Mass. (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.
Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.; 801 Woodward Ave., Detroit, Mich.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING EQUIPMENT — ELECTRIC.

Edison Storage Battery Co., 137 Lakeside Ave., Orange, N. J.

Esterline Company, The, La Fayette, Ind. (Matchless.)
Branches: Detroit, Mich.; San Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 810½ Chapel St., New Haven, Conn.

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York City.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Bretz Co., J. S., 250 W. 54th St., New York City (U. & H.)

Herz & Co., 295 Lafayette St., New York City (Herz.)

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

BUYERS' GUIDE---Continued

Marburg Bros., 1777 Broadway, New York City (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: 1679 Broadway, New York City; 1110 South Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-436 Van Ness Ave., San Francisco, Cal.; 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MEASURES, ETC.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MOTORCYCLES AND MOTORCYCLE SUPPLIES.

American F. N. Co., Boston (F. N.)
Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

International Automobile Association, Shelden M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 122 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

OILS, GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)
Branches: Boston, Mass.; Fall River, Mass.; Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)
Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Harris Oil Co., Muncie, Ind. (Autoil.)

Havoline Oil Co., 17 Battery Place, New York City (Havoline.)
Branches: Pacific Coast — Kohl Bldg, San Francisco, Cal; Western—People's Gas Bldg., Chicago, Ill.; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul, Minn.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Hawn, Geo. A., 77 Pine St., New York City. (Panhard.)
Branch: 899 Boylston St., Boston.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)
Branch: 284 Columbus Ave., Boston, Mass.

Kincaid Oil Co., 219-221 West Exchange St., Providence, R. I. (Kincaid.)

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston, Mass.; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)

Texas Company, The, 7 West St., New York City.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston, Mass.; 605 Brown Bros. Bldg., Philadelphia, Penn.; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., 80 Broad St., New York City (Wolverine.)
Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.; 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE PUMPS, ETC.

Ideal Oil Pump & Tank Co., 146 Summer St., Boston, Mass.

Randall-Faichney Co., Boston, Mass. (B-Line.)

POLISHES.

Harris Oil Co., Muncie, Ind. (Metal, Wood, Leather.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

RADIATORS.

Eureka Auto Parts Mfg. Co., 3100 Olive St., St. Louis, Mo. (Eureka.)

RIMS — REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

Webb-Veitch Co., 1777 Broadway, New York City. (Invex.)

Willard Storage Battery Co., Cleveland, O. (L B A.)
Branches: 136 West 52nd St., New York City; 1191 Woodward Ave., Detroit, Mich.; 436 South Dearborn St., Chicago, Ill.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17 St., Philadelphia, Penn. ("J-M.")
Branches: 218 W. 84th St., New York City; 222 Eliot St., Boston, Mass.; Teck Building, Buffalo, N. Y.; 10 W. Eager St., Baltimore, Md.; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

SOAPS.

Harris Oil Co., Muncie, Ind.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York City.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Frontier Specialty Co., 734 Main St., Buffalo, N. Y. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Herz & Co., 295 Lafayette St., New York City (Bougie Mercedes.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Mac-Kae Manufacturing Co., Boston, Mass. (Mac-Kae.)

Rex Ignition Manufacturing Co., 1779 Broadway, New York. (Rex.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Mac-Kae Mfg. Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORDING DEVICES.

Casgrain Speedometer Co., 172 Columbus Ave., Boston, Mass.
Branches: 1919 Broadway, New York City; 2031 Euclid Ave., Cleveland, O.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York City; 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)
Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.;

BUYERS' GUIDE---Concluded

1212 South Main St., Los Angeles, Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 870 Woodward Ave., Detroit, Mich.; 330½ North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis, Mo.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Ideal Oil Pump & Tank Co., 146 Summer St., Boston, Mass.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Ignition Co., 2829 Chester Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Empire Tire Co., Trenton, N. J.
Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia,

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston, Mass.; 17½ Dorrance St., Providence, R. I.

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In principal cities.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

Western Automobile Supply Co., 3900 Sheridan road, Chicago, Ill. (Auto Inner Casings.)

TIRE INFLATING TANKS.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PROTECTORS.

New Tyr Manufacturing Co., 771 Lexington Ave., New York City. (New Tyr.)

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. **(Tite-Wad Rubber Putty.)**

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Chicago, Detroit, Kansas City.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tire Casings and Inner Tubes.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, **Mass.**
Branches: See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

United States Tire Co., Broadway and 58th St., New York City.
Branches: See Rims—Removable and Detachable.

TIRE TOOLS AND REMOVING EQUIPMENT.

Beck Co., The, Box 67c, **Rockville** Centre, N. Y.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, **Mass.** (Vibrator.)
Branch: 1974 Broadway, New York City.

TRUCK BODIES.

Lynch Manufacturing Co., East Side Station, Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit, Mich.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Lansing Co., formerly Lansing Wheelbarrow Co., Lansing, Mich.
Branches: Factory, Parkin, Ark.; 78 Cambridge St., Boston, Mass.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Pitless Auto Turntable Co., Kansas City, **Mo.**

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, Hartford, Conn. (Kant-Break.)

VALVE DRESSERS.

Crone, F. G., 331 **Genesee St., Buffalo,** N. Y.

VULCANIZERS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Garage and Individual.)
Branches: In all principal cities.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WINDSHIELDS AND WINDSHIELD CLEANERS.

Conover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. **54th St.,** New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

Coes Wrench Co., Worcester, **Mass.**

Cutter, Geo. A., Taunton, **Mass.**

Walworth Mfg. Co., Boston, **Mass.** (Stillson.)

THE ACCESSORY AND GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. I. PAWTUCKET, R. I., MARCH, 1912. No. 5

TRADE INFORMATION EXCHANGE.

Free Service Established by the Accessory and Garage Journal to Furnish Confidential Business Intelligence, Relating to Production and Distribution, to the Buying and Selling Interests of the Nation.

The demand by the trade, as represented by the dealers in and agents for both pleasure and commercial vehicles, accessories and supplies, the garage and public service stations and repairmen, for information relative to the qualities and merits of all marketable products in the automobile industries, has attained such proportions as to impel the establishment of a Trade Information Exchange, in connection with the publishing of the Accessory and Garage Journal.

This service, complete and comprehensive in every detail, is absolutely without charge to all concerns listed in the Buyers' Guide in The Automobile Journal, Motor Truck and the Accessory and Garage Journal, and to all automobile dealers, accessory and supply dealers, garage and public service station owners, and repairers, who are regular subscribers to the Accessory and Garage Journal. This service does not extend to manufacturers and selling agents for manufacturers not listed in the Buyers' Guides of the publications named.

This service offers to all manufacturers of power driven vehicles, equipment and supplies, who are entitled to its advantages, the opportunity to reach those interested in selling and distributing in any town, city, state or section of the country.

No business man has always at his command the trade information that might be desirable. Demands made upon the trade are such that no one can compile such reference as will inform him of every industrial fact it may be imperative to know. He has no source available from which this information may be obtained. This Exchange has been established to supply any industrial or trade fact to its members at request. This service economizes the time of the business man and his customer; it minimizes correspondence; it places the dealer in contact with every product in the particular line under consideration and the manufacturers' selling propositions; the dealer purchases that which will best meet his requirement and satisfy his customer, and the dealer has the use of this information in all his future transactions. It gives every interest in the market equal consideration and opportunity.

Thousands of active enterprises, seeking expansion or desirous of making new connections, have in this service the means of conducting their negotiations confidentially and securing information that must be beneficial to all manufacturing and distributing interests.

All trade information passing through the Exchange is of a confidential character. Inquiries received from those in the trade relative to prospective connections or associations are distributed to the manufacturing interests of which information is desired. The replies of the manufacturers or selling agents pass through the Exchange direct to the inquirer, who then conducts his negotiations as his judgment dictates.

Manufacturers through this service will be able to reach desirable trade interests in territory now having no representation, and complete their organizations.

To illustrate the Trade Information Exchange service:

John Smith of Phoenix, Ariz., desires to secure the agency for a car selling for $1200. He communicates with the Exchange, stating his limitations and that he is desirous of obtaining sales rights for a specified territory. His inquiry is given a number. Its purport is submitted to all makers of cars within the price limit fixed entitled to the service. The replies of the manufacturers to the number are received at the Exchange and are forwarded to John Smith. He considers the facts and propositions submitted and closes the contract.

John Smith has had opportunity to pass upon all the qualities of every car and every proposal. He selects that which he judges will be the best from a business point of view. Every manufacturer has received equal consideration and each has the knowledge that his production has been approved or rejected from its actual qualities and merits.

Thomas Jones, who is to establish a garage, desires a full equipment. In his letter of inquiry to the Exchange he states his exact requirements, and these are submitted to those producing the lines in which he has interest and from which he will make a choice.

Any dealer desiring to expand his business and make new connections can make the fullest inquiry in the market through the Exchange.

This service extends to all branches of the industries. The correspondence is passed and submitted as stated, the negotiations being as confidential as those concerned in them may desire.

To facilitate the interests of the Exchange and those whom it is intended to serve, address all correspondence to the Trade Information Exchange, Accessory and Garage Journal, Times Building, Pawtucket, R. I.

MAILING LIST COST AND SERVICE.

Expense of Doubtful and Limited Publicity Conducted by the Individual or Enterprise, Reduced 80 Per Cent. and Its Efficiency and Scope Extended to the Entire Industry and Trade.

EVERY business of consequence, no matter whether its market is local, sectional, national, or international, is exploited by the distribution of information to its regular, occasional or prospective customers. The purpose is to bring to the direct attention of those constituting its market facts that cannot be supplied through other channels. To gain publicity at an opportune time is the main object, it being believed that this can best be accomplished by what is regarded as nearest approaching a personal appeal. The mail is the natural and most systematic means for distribution and it is always available. It affords to all the same rapid and economical facilities. The value of its service has been recognized and utilized to an extent that is little realized save at periods when the enormous resources of the government are temporarily inadequate to maintain the scheduled collections and deliveries.

The man who maintains the local enterprise finds it profitable to make announcement through the mail. He can secure the attention of those who are directly concerned and the number of replies or inquiries is generally sufficient to justify the expenditure. Oftentimes the returns are exceedingly large. A means is afforded of tracing the direct results of the publicity sent out, and drawing customers to a special line or sale.

As the business is extended the use of the mail facilities affords every quality that caused its adoption in the community, with the additional merit of greater economy proportionate to the area covered. With the manufacturer the mailing list permits announcement at will to all engaged in the distribution and sale of his products. With the jobber similar advantages obtain, and with the representative there is for the third time the need of the systematized statement to probable customers.

Thus it will be seen that as the market is increased there is greater necessity of informing the public of every detail of purchasing knowledge. The mailing list was first adopted as a convenience. Now it is one of the most important divisions of a business, particularly if this business is transacted over a large area. In fact the disposition is to create such proportions for any enterprise engaged in.

The preparation of mailing lists is now specialized and these can be purchased as desired, but the purchaseable list, no matter how complete, must be constantly revised to maintain its value. The percentage of changes is decidedly large. The larger the number of addresses the greater the difficulty of maintenance and revision. The only possibility is through the use of first class postage, which just doubles the stamp cost. This is a decidedly heavy price for this insurance. The expenditure is the same for each time the list is utilized.

Some concerns practically departmentalize their mailing and combine it with their correspondence so far as this can be done, but divisions of this character require the services of several clerks and more or less special equipment. Careful system may be followed but the uncertainty is never eliminated because of the character of the lists. An average mailing list may include 3000 names and 5000 may be considered large. Few will reach 10,000 and more than that number is rarely ever accumulated. It will not be denied, however, that the larger the number of addresses reached by any given distribution of publicity matter the percentage of inquiries ought to be maintained. Not only this, but the cost is decreased as the list increases, because the initial expense is relatively less.

Considering a reasonably accurate list the purchase price would approximate $100, and if this is of 5000 names to properly maintain it and to do the addressing, folding, stamping, etc., would cost $30 a month. To use a list of 10,000 or 12,000 names would cost at least $50 a month for maintenance. These figures are reasonably accurate and are not more than a fair average cost for the service. To employ such a list to good advantage let us say that it it is used once a month, for active concerns can and do reach their customers and prospects much oftener.

The next item is the printing, and this means that the copy must be prepared, the cuts made and the proofs revised by direct supervision, and a very low estimate of the cost by pages follows:

	Copies		
	5,000	10,000	12,000
One page	$15.00	$20.00	$22.50
Two pages	20.00	30.00	35.00
Three pages	22.50	37.50	42.50
Four pages	25.00	45.00	50.00

The cost of a fair grade of envelope is not less than $1 a thousand, and the cost of stamps is not varied by the quantity purchased.

Estimating the cost of circularizing by using the mailing list the following figures will be a reasonable average:

One Page—

Copies	5.000	10,000	12.000
Printing	$15.00	$20.00	$22.50
Envelopes	5.00	10.00	12.00
Stamps, (1c)	50.00	100.00	120.00
Addressing, maintenance	30.00	50.00	50.00
	$100.00	$180.00	$204.50
Cost per copy mailed	2.00c	1.80c	1.70c

Two Pages—			
Copies	5,000	10,000	12,000
Printing	$20.00	$30.00	$35.00
Envelopes	5.00	10.00	12.00
Stamps, (1c)	50.00	100.00	120.00
Addressing, maintenance	30.00	50.00	50.00
	$105.00	$190.00	$217.00
Cost per copy mailed	2.10c	1.90c	1.80c
Three Pages—			
Copies	5,000	10,000	12,000
Printing	$22.50	$37.50	$42.50
Envelopes	5.00	10.00	12.00
Stamps, (1c)	50.00	100.00	120.00
Addressing, maintenance	30.00	50.00	50.00
	$107.50	$197.50	$224.50
Cost per copy mailed	2.15c	1.97c	1.87c
Four Pages—			
Copies	5,000	10,000	12,000
Printing	$25.00	$45.00	$50.00
Envelopes	5.00	10.00	12.00
Stamps, (1c)	50.00	100.00	120.00
Addressing, maintenance	30.00	50.00	50.00
	$110.00	$205.00	$232.00
Cost per copy mailed	2.20c	2.05c	1.90c

The above tabulation relates only to the use of the cheapest postage. To give the insurance of delivery and attention that desired first class postage must be used, and this will increase the cost of mailing 5000 copies exactly 100 per cent. One may ascertain from the above that it approximately increases the cost of mailing 10,000 four-page circulars 50 per cent. It will be seen that the actual printing expense is from 15 to 22 per cent. of the bill, and the remainder goes for the mailing, and maintenance. With first class postage this percentage is materially decreased.

Considering the facts stated it will be understood that the cost of the number of copies that reach live purchasing interests is relatively larger than is indicated by the tabulation, for everything depends upon the mailing list. For instance, if there be 10 per cent. "dead" this increases the cost in the same ratio, and taking the single piece it will be seen that this is a material advance. There is no good reason for using a poor mailing list and if it is kept to the highest standard, systematic and careful supervision is necessary. It is not uncommon for lists that are assumed to be high class having names of persons dead for years, and of addresses of persons not even known.

In contrast with this form of publicity may be noted the service afforded by the Accessory and Garage Journal, which has a circulation in excess of 12,000, guaranteed to any advertiser. The cost for a page a single time is $60 and by yearly contract this price is reduced to $50. Comparing this with the tabulated facts it may be noted that the cost of a single page is but half the expense for reaching 5000 persons, and less than 25 per cent. of the cost of reaching 12,000 persons, with a single page circular.

The price of two pages would be $100 in the magazine and a two-page circular to 5000 addresses would cost $105, and $217 if sent to 12,000. Three pages of the magazine would entail an expense of $150, and a three-page circular sent out with penny postage to 12,000 would cost nearly 50 per cent. additional, while the $200 charged for four pages would be less by $32 than the expense for reaching 12,000 with a four-page circular. Taking first class postage it will be understood that one could advertise in three pages of the Accessory and Garage Journal regularly by contract for the cost of sending a single page circular to 5000 addresses.

Regarded from any angle it will be found there is surprising cheapness in the service of the Accessory and Garage Journal. Its mailing list is the most complete compilation of actual buyers that exists. Its real value is in the thoroughness of its compilation and the completeness of its revision, a work that has been systematized with extreme care and with the one purpose of establishing its commercial worth. It deals with a market and a series of industries that have grown with marvellous rapidity and with widely extended relations, and its specialized intelligence has a distinct place and is depended upon as authentic. It is the only publication of its kind in America and as a trade paper for the trade it reaches the executives and the buying interests of every industry directly identified or allied with the vehicle production or marketing.

HOW SHOULD SHOP CHARGES BE ESTABLISHED?

Editor Accessory and Garage Journal:—

The problem of arriving at the cost of an overhauling job before the work is completed, has been satisfactorily solved by some of the larger automobile concerns in the manner stated below.

When a customer takes his car to a repair shop for an overhauling, he naturally wants to know the approximate cost of the job before authorizing the work. He cannot be blamed for taking this attitude, as the charges for overhauling are, in some cases, greatly out of proportion to the value of the machine. The automobile manufacturers are largely responsible for this condition, owing to the extreme prices charged for repair parts compared with the selling price of the car.

It is, however, poor policy to estimate the expense of overhauling a car, for the following reasons:

First—It is utterly impossible for the repair man to know the extent of work necessary before dismantling the machine, and consequently he cannot make a fair estimate to himself or the customer.

Second—The repair man must make the price high enough to protect himself, and by so doing he is apt to lose the job by frightening the customer away.

Third—When an overhauling job is undertaken at a fixed price the question naturally arises as to whether the charge should include the replacing of all parts which are worn to any appreciable extent. There is such a vast difference between giving a machine a "thorough overhauling" and putting it in "shape to run" that it is unsafe to proceed until this point has been definitely settled.

Experience has shown that the following method is the only businesslike and satisfactory way of dealing with a proposition of this nature:

Explain to the customer who inquires as to the cost of overhauling his car how impossible it would be to make him an estimate before inspecting the dismantled car. Advise him that when you have taken the car down you will call him in or write him a letter explaining the exact condition and will then be able to give the approximate cost of doing the work. It is a good plan not only to furnish an itemized list of parts that must be replaced, but also to state the condition of such parts as gears, shafts, etc., which may be partially worn and yet good enough for several thousand miles additional service. If the questionable parts are not readily accessible, the customer will usually prefer that new parts be put in, rather than run the risk of laying up the machine for further repairs during the season. The easiest way to convince the customer that you are not trying to "pad the order" is to show him the worn parts, and explain from a mechanical standpoint the advisability of substituting new material. This procedure will prevent unpleasant arbitration of the bill, and the customer will go away with a feeling that the garage man has given him a square deal.

When a customer absolutely refuses to have his car dismantled without being given an idea of the cost, inform him that the charges will simply cover the catalogue price of the parts plus the time at a certain stated price per hour. Few drivers are, however, expert enough to determine from operating the car what parts require renewal, consequently it is out of the question to properly estimate work of this character. E. P. HOBART.

Detroit, Mich., March 14.

Editor Accessory and Garage Journal:—

In discussing this subject from a practical standpoint, it must be assumed that the car owner is satisfied that he will not be imposed upon. It would be useless to attempt to devise a system by which the manager of a repair shop could hope to handle repair work to the satisfaction of a customer whose confidence he does not possess. However reasonable the charge or thorough the work performed for a customer who distrusts the management, he will always have a lurking feeling that something is wrong. If the charge is as high or higher than he anticipated he feels sure he has been overcharged. If it is lower, he is afraid the work has been slighted. An owner's confidence, once forfeited, is extremely hard to regain, and it is a wise garage manager who early grasps the fact that the car owners as a class are possessed of more than average business ability and are quick to detect fraud in any form.

When extensive repairs are required, the owner is apt to hesitate to place the car in the hands of a repair man without protecting himself by securing an estimate of the repair cost. Not having been given the opportunity to disassemble the car to determine the extent of the trouble, the repairer is placed in a difficult position. He knows that a number of parts not actually the seat of the trouble will have to be repaired or replaced to put the machine in good order, and also that unforeseen difficulties may be experienced in effecting some usually simple operation. Under these circumstances it becomes evident that the best course to follow is not to attempt a definite estimate of repair cost.

It is at this point, that the manager of a repair shop appreciates the advantage of a strong hold upon the confidence of his customer, enabling him to explain that it is obviously impossible to furnish an accurate estimate, but that he is confident he can make the repairs as economically as anyone and believes that their previous dealings will substantiate his assertion.

Being able to convince the customer of these facts he should question him carefully as to the operation of the car when last in service and, if advised of unsatisfactory operation under certain circumstances, he should suggest what repairs are probably needed to overcome these difficulties. The more fully the ground is covered at this time, the less possibility there will be of controversy arising when repairs are begun and the need of various adjustments becomes evident.

Should the customer, for any reason, insist upon an estimate, the best course to follow is to fix the price considerably over the usual cost of such work, after having impressed upon him the difficulty of arriving at an accurate estimate. The customer naturally expects the repairer to state the maximum price for such work, and should it become necessary to charge the exact amount quoted he will assume that the charge has been raised to the limit, whereas, if the actual charge made is comfortably below the estimate, he is likely to feel that he has been given a square deal. There can be no excuse for a repair man taking advantage of a customer who has accepted such an estimate. If, when the work is completed, he finds that the price stated is higher than necessary to give him a fair profit, the actual charge made should be at the proper figure. He will thus obtain his just dues, and without question gain a satisfied customer, whose recommendation will be of inestimable value. A. L. WHITE.

Detroit, Mich., March 18.

ENGINE NOISES AT HIGH SPEEDS.

The experienced repair man has often noticed that some engines which operate very smoothly and quietly at low and medium speeds become coarse at higher velocities. It is often difficult to determine the cause of this peculiar and undesirable action. Sometimes it may be due to poor design or construction of the engine, but if the power plant has been produced by a reputable maker it is natural to assume that the question of balance of rotary and reciprocating parts has received the attention it deserves. As a rule, the objectionable sensation is a combination of very small but noticeable vibrations communicated through the floorboards and accompanied by more noise than the speed of the car seems to warrant.

In cases of this kind, the trouble is very often due to a slight slipping of the clutch, either of the plate or cone type, though it is more apt to happen between the plane frictional surfaces of the former than with the cone shaped members. When the engine is running fast and developing high power, it may produce just a little more than the clutch will transmit, especially where there is a very close margin in the design. The resulting slip makes for noisy operation. The slipping will not be as pronounced as though the clutch was inadequate for the work, and the engine does not race. There is, however, a small amount of slip each impulse this setting up the rhythmic and penetrating vibration that is distinctly annoying.

Another insidious cause of coarse running of good motors at high speeds is in unbalanced clutch parts. It is often noticed on examining the flywheel that it has one or more holes drilled in its rim, the purpose being to balance the wheel.

HOME MADE WATER PAIL.

A collapsible water pail is useful in the equipment of the car especially when touring. While this may be purchased one can be made easily and without expense. From an old inner tube select three or four feet of the rubber that is water tight. Cut the desired length from it and close one end by cementing it under pressure.

VALUE OF TRADE MARKED GOODS.

Worth of Guaranteed Products Evidenced by Imitations by Industrial Highwaymen, Who Exist by Cheapening the Standard of the People.

In industrial and commercial competition nothing has so much value as the distinction between productions made possible by the use of a trade mark. When it is placed upon the products by the maker it is guarantee of quality and value as standardized by the producer, and the existence of the brand is guarantee to the purchaser that the recognized qualities have been supplied at his demand. To establish public recognition of a trade mark is an undertaking of larger proportions. It can only be obtained by satisfactory and efficient publicity and by the distribution of production that inspires confidence and impels patronage through personal experience. The cost may be either large in amount of money invested to attract attention or in a long period of time devoted to patient and careful exploitation and in systematic maintenance of quality.

Under any circumstances a trade mark identifying goods has the same relative merit that has the name of an individual or firm in the business world. Either may be sacrificed, but both have value that is quite beyond price. Perhaps no better illustration may be made than to contrast the worth of the publicly recognized product with that unknown. With the former the purchaser is assured of what is regarded as worth the price. With the latter there may be equality in every respect, or there may be decided inferiority. One is known and the other is unknown. Human nature impels confidence in what we know. The assurance is given for the difference in price.

These facts have been especially emphasized in the lubricants industry where manufacturers have sought to produce what has been determined by scientific methods and practical and continued experiment to be best suited for specific purposes in internal combustion engine operation. These products have been standardized as to quality after exhaustive chemical research, perfected refining processes, and constant observation of operating conditions and requirements with many classes and types of motors. The natural purpose of those producing these lubricants has been to perfect manufacturing and preserve, if not improve upon, the standard.

In gas engine lubricity deterioration of quality is abundantly evidenced. It is manifested unmistakably and results are always clear to experts, but they are not always understood by those less experienced. There are those who regard the use of a cheaper article an economy, while there are others who believe that the real saving is in using that which will insure the largest production of power and the preservation of their machinery. The former class must be taught by experience and this knowledge is often costly. Under any circumstances quality is the real value and when merit has been established and is generally known it is guaranteed to those purchasing by the brand or trade mark.

Some manufacturers have individualized by a name, others by a design, still others by a form of container, each seeking what will be recognized by the public and will be accepted without question by the buyers. This has meant the education of the people to the merit represented by the name. While the identification means much to the owner it is even more valuable to the consumer, and it is the sole protection for both.

As in all other industries, there are those engaged in the manufacture and sale of lubricants who have sought to profit by imitation of marks and brands, placing in the market products that may be far inferior as to quality, and literally pirating upon the reputation of what they imitate. There is seemingly no limitation to the methods of those who are unscrupulous. They seek to reap large profits by obtaining relatively high prices, for the standards of the market are invariably selected for their attacks, and often distribute the cheapest products, for they realize that it is only a matter of time before means will be taken to restrain them, and their deception, when known, will eventually eliminate them from legitimate business.

Industrial highwaymen base their campaigns on the cupidity of the people, believing that the desire to seemingly economize will warp better judgment and impel the purchasing of what is apparently cheaper and is not guaranteed. One fact is evidently lost sight of, and that is that it would be immensely profitable for those whose products are imitated to sell the same qualities as the imitations. There is but one reason why this is not done, and that is the reputation established by the superior article, and the knowledge that what has been developed, oftentimes at enormous cost, would eventually be lost.

There are those who fail to realize that the manufacturer of the high grade products must necessarily pay the cost of protecting his customers. This adds materially to prices charged. Without this protection the products could be sold lower, and as a matter of fact it is the fostering of illegimate competition by the people that necessitates safeguarding a production and they compel themselves to pay more than might be required were it not for the consequences of their own false conception of economy. Manufacturing can be cheapened by producing in increasing volume and distribution expense can be likewise lessened when a sales organization has been perfected, but reputation cannot be continued save through continued satisfaction.

Because of the willingness of those who are ignorant, or who attempt to deceive themselves by attempted economy, there are men who are existing commercially on the reputation of enterprises of undoubted standing, who are the sharks and jackals of business, and who prosper proportionately to the audacity of their methods and the tolerance of those who are their victims.

While imitation and substitution may be regarded by some as competition it is apparent that those who substitute and imitate are the gainers only, and the purchasers are even the more imposed upon because they not only receive an inferior article, to their own direct loss, but they do not realize the quality, which is the sole recommendation of the superior product.

Notes on Working Steel—To drill and file hard castings or hard iron use turpentine on drill or file; you will be surprised at the result.

To restore burnt steel, heat to a red, cool in water and repeat two or three times. It will restore steel, to a certain extent, if not burnt too badly.

To caseharden anvil tools made of iron, heat to a bright red and rub on prussiate of potash or cyanide of potassium and cool in water immediately.

To weld low steel or iron to malleable castings, use one part of sal ammoniac, 10 parts of borax. Melt together, then grind fine.

A good and reliable welding compound is made of two parts of borax, one-half part of sal ammoniac. Mix and melt them together. When cold reduce them to a powder. Use same as borax.

THE BUSINESS MAN AND THE PATENT.

Protection of His Products by the Patentee Are Important Factors in Selection of Lines of Marketable Goods.

Immediate results are seldom considered by the business man when he takes up the distribution of an article, commodity or product. Establishment is always the first desideratum, recognition the second, and continuous patronage and continuity the third and real purpose to be accomplished. To attain what is regarded as success it is essential to build upon a foundation that will endure, and for this reason it is imperative that the lines dealt in be selected with extreme care.

No man cares to engage in what is even known to be uncertain as to outcome, and seldom it is that a man will undertake what appears to be a risk, especially when he has another choice. Men may be over-confident and take too much for granted, but the average individual will enter into business only after careful investigation of what he is to deal in and with at least reasonable knowledge of his line and knowledge of his probable trade.

It is evident that it is becoming more and more a problem for the man who is desirous of establishing himself as a representative, or handling the products of another, to select what will become a stable article of trade. This has been emphasized in many ways, but one of the most pronounced influences is the disposition of those producing under patent rights to protect themselves against imitators and imitations so far as this may be done through the medium of the law.

It is guaranteed to the owner or licensee by the issuance of a patent that a measure of protection shall be afforded, which is justification for organized industry and the exploitation of the product. The right of the patentee to the monopoly thus created has never been questioned or denied. Each person would not hesitate to benefit through the law, and there is no criticism when the penalties are imposed upon those who infringe upon it. It is true that the inherent desire to trade or economize dictates the lowest price obtainable for the buyer and the highest for the seller, but this is merely a matter of individual satisfaction and does not concern the masses.

The law exists and its protection is insured to all alike. Those who violate it must assume the consequences. The patent is based upon what must be regarded as good authority and is so accepted. Those who essay improvement or perfection must obey the legal requirements. The same restriction as to manufacture applies equally well to use, so that there is a responsibility shared by the distributors and the consumers, which seemingly has not been generally understood or realized.

Business ventures are not usually "get-rich-quick" propositions. This being so they must conform to and accept conventional methods. Public patronage as bestowed is with recognition of commercial conventions and these must be lived up to by the seller and buyer. Because there is willingness to embrace the fullest opportunities and the largest measure of privilege afforded by the patent law, and there is better realization of the benefits obtaining, is the more reason why there should be even extreme care in dealing with patented products.

There are recognized lines, many of which are standard in the market, and these are usually distributed with publicity that is productive of custom. The business man who deals with these has support in his endeavors that is far-reaching and he has reasonable assurance that he will be far more successful, both immediately and in future, for promotion by the producer must be proportionate to the demand. Neither is there a possibility that what has been created by conscientious and persistent work may be destroyed by conditions entirely beyond his control and by circumstances which his activities may have in part brought about.

SENSATIONALISM IN TRADE INTELLIGENCE.

Economy of Truth or Unfounded Comment to Inspire Fear the Weapon of Those Who Live by Wielding the "Big Stick."

Of utmost value and importance to the industries and commerce of the nation is dependable trade and industrial intelligence. One of the greatest of all modern business problems is the dissemination of information relative to those engaged in it. Public knowledge of an enterprise is its largest asset because primarily a demand must be created. Production is governed by the requirements of those who are informed and it may be adapted to any conditions. Sentiment is natural and is the strongest characteristic of human nature. It has material influence in shaping our lives, and often against our better judgment. Opinion is based by judgment of facts as we understand them. Sentiment has no actual place in industry or commerce, but opinion governs both. Primarily, facts must be reflected by mediums for public intelligence, and for this purpose the trade publications exist.

Because of the acceptance of the facts as published by those who have no better sources of information there is a responsibility among publishers that is extremely large. Public prints can accomplish vast good or cause great injury or damage by presentation of what may be accepted as authentic by those who read them. There are legal proscriptions which seemingly prohibit the publication of what might be regarded as directly or indirectly, intentionally or unintentionally, malicious or damaging. These restrictions differ in many states. It is probable that no laws are less understood than those relative to libel, and for this reason there is little public realization of the possible results of assumed occasions for redress.

Aside from the legal aspect there are moral and ethical restrictions that cannot be denied or evaded by those whom they concern, and these require that the information published should be facts, and facts that may be established beyond any possibility of doubt. This does not mean that what is generally known as promotive publicity should be rejected, because this serves a decidedly useful purpose, but it does mean that whatever will be misconstrued or misunderstood by the industry and trade should be verified or qualified. The reason for this is the natural tendency to comment and amplify and conclude and assume, to the injury of those who are the victims.

A rumor, a suspicion or an assumption may be seized upon as opportunity for trade sensationalism that cannot be otherwise than destructive. Actual facts when regarded without prejudice or purpose and fully understood may appear entirely different. It is not possible for any person responsible for the conduct of a publication to be fully informed as to concerns widely scattered, which are often written of without thought of the consequences when such writings are read and believed by those more or less interested.

Where there is possibility of erroneous information, and there is no attempt at verification, then the only conclusion that can be reached is that there is intent to mislead or unduly influence those who shall read the publication. Where there is economy of the truth, misrepresentation must at least be charged, and if there be comment that will create suspicion or loss of confidence there can be no other supposition than that actual injury has been attempted.

The results of statements published cannot be predicted. The reputation of a firm may be shattered, its credit may be impaired or its product discredited by the publication of what may appear to be a fact. The public does not wait for complete knowledge before judgment is given, and the effects are cumulative. The damage has been wrought and it cannot be repaired. Even in the event of no cause for speculation, and no occasion for comment, much time and great effort is necessary to restore confidence.

Business men, whose products are sold generally, and whose reputations must be maintained with much care because of their extended relations, are exceedingly careful to protect themselves against erroneous or misleading intelligence, and this condition seemingly makes possible the wielding of a "big stick" by those who might believe that fear is a more potent influence than actual merit of their publication in securing patronage. The sensation monger is a dangerous element in society, but he can destroy instead of smirch, and ruin instead of annoying when he attacks the legitimate business interests of many, perhaps through one firm or enterprise.

PROTECTING CELLULOID WINDOWS.

Some operators whose cars are not equipped with the glass type of windshield utilize the front curtain of the top for protection against the weather. These members are fitted with celluloid and many drivers cut small openings for the purpose of obtaining a clear vision of the road, and the practise is adopted more especially as rain or snow on the window obstructs the view.

Unless care be exercised in cutting the holes, the material is likely to be torn easily, especially when the member is rolled up and fastened to the top. Some fit a binding of leather around the edges of the aperture and cement it to the celluloid. A better method is to cut a ring-shaped strip of celluloid and attach it, which operation may be performed by making a solution comprising one dram of fine shredded celluloid dissolved in two ounces of acetate of amyl. This will create a thick, sirupy mixture and should be applied with a camel's hair brush. The material to be joined should be cleaned thoroughly, and the parts should be allowed to dry for several hours before using.

LENS MIRROR LAMPS AND BURNERS.

When one has disbursed a large sum for new head lamps provided with genuine Mangin mirror lenses of large diameter, it is very annoying to dismount and find both lenses cracked right through to their base. This is likely to occur if the lamps be fitted with burners which create a flat flame by the impingement of two jets of gas at right angles in the plane of the car's direction of travel, and actually befell the writer last week. It was partly his own fault, as the light had commenced to grow pallid, but as his destination was near he drove on stubbornly instead of stopping. Each burner was found to be choked from some mysterious reason, in spite of a new filter figuring in the gas circuit, and the front jet was directing a spear of flame right on to each mirror, with the inevitable result. Burners of a different type have now been fitted, and these cannot throw a spear of flame astern. —B. H. D. in Autocar.

Rust Preventative—To prevent rust, dissolve one ounce of camphor in one pound of melted lard, remove the scum, mix as much black lead with lard and camphor, as will give it an iron color, clean the machinery well, smear with the mixture, and after 20 hours rub off, clean and polish with soft cloth.

REMOVING STUCK WOOD SCREW.

A handy way to remove a wood screw that has stuck, and is so tight that there is danger of twisting off the head, is as follows: Heat a poker or a piece of round iron red hot, and hold it against the screw head for a little while. Wait a few minutes for the screw to cool off, when it will be found that the screw can be removed quite easily with the same screw driver that just previously would not perform the work. The explanation is simple. The red-hot poker heats the screw; the screw expands, and makes the hole it is in just a bit bigger. The screw then cools down and resumes its original size, leaving the hole in the wood a size larger. The writer has given this little kink a fair test in taking screws out of some oak boards that were built in a refrigerator where the wood had become set around the screws.

DRAINING THE PAN.

Cars not fitted with some method of draining the pans of the accumulation of grease or oil deposit lubricant while ascending grades and sometimes when entering the garage where the approach is at an incline. In addition to being unclean there is more or less danger where the shields are in this condition, because gasoline may gather as a result of the carburetor flooding and should the fuel catch fire it would be difficult to extinguish the blaze.

Removing Rust from Nickel—To remove rust spots from nickeled surfaces grease the rusty part well, allowing the vaseline or similar substance to remain for a number of hours, when it should be rubbed with a rag dipped in ammonia. This treatment will do away with most rust spots, but if any of these are difficult to remove, they should be carefully dampened with a little diluted hydrochloric acid and quickly wiped dry. The surfaces so treated should be washed with clean water, and when dry, rubbed with polishing powder.

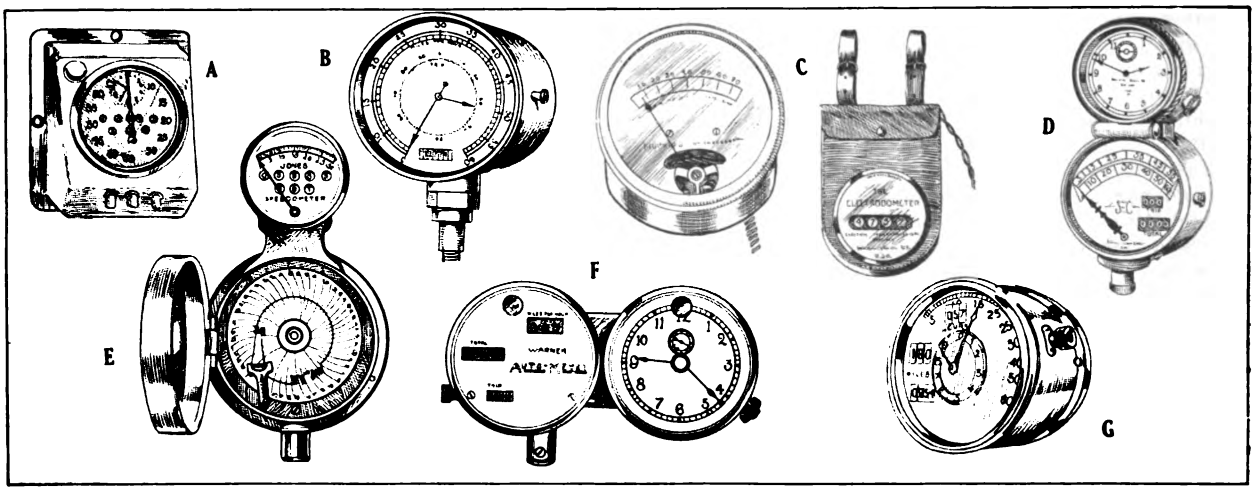
Hardening Reamers—Heat slowly and evenly to a bright cherry red, quench quickly and immediately immerse in a bath of linseed oil, holding the reamers vertically, and then draw the temper to a straw color, as for a tap or die.

ACCESSORIES AND APPLIANCES THAT SELL.

CONTINUING the discussion of prominent accessories from the last issue of The ACCESSORY and GARAGE JOURNAL, herein is set forth many of the leading makes of supplies and fittings designed for the proper maintenance of the car or the convenience and enjoyment of motoring. As has been stated, many cars are sold today with what is known as complete equipment, but in spite of this the purchasers often have occasion to add details which more nearly approach their ideals, and there are some so-called accessories which require renewal from time to time. In any event it is desirable to become thoroughly acquainted with the standard productions. The illustrations and brief descriptions below will serve to call more forcibly to mind those devices or supplies which have been most extensively exploited and therefore recognized as measuring fully up to the demands of the modern automobile.

SPEEDOMETERS.

The automobile owner who would comply with the requirements of the laws will find one of the most necessary equipments for his vehicle to be a speedometer, and these instruments have been improved and perfected in many ways. There is a very wide range of qualities and values in these indicators.



Speedometers: A, Stover-Lang; B, Reliance; C, Hopkins (Electric); D, Sears-Cross; E, Jones; F, Warner, G, Cleveland.

Stewart.

The Stewart, made by the Stewart & Clark Manufacturing Company, Chicago, Ill., is produced in numerous models and in combination with clocks suited for all purposes. The principle of operation is by magnetic influence. One feature is a provision for the regulation of some models by micrometer. Another is that the trip register may at any time be set to any tenth of a mile. Besides refining and improving the indicators, the shafts and fittings have been considerably perfected.

Jones.

Besides the standard Jones models, produced by the Jones Speedometer Company, New Rochelle, N. Y., which have been little changed, aside from the use of nickel and black enamel for case finish, the truck service types have been improved by heavier fittings. There is in addition the Jones hub odometer for service wagons and there is as well the Jones recorder, which will register the period of service, distance and speed, when the vehicle is in motion, duration of stops and driving, on a chart that may be removed and preserved for record.

Warner.

Made by the Warner Instrument Company, Beloit, Wis., the Warner is the pioneer magnetic instrument and has been so perfected that little change has been made in the 1912 models other than to install a reset for the trip register on the bezel types. This is designed for the benefit of those who desire to make deviations from routes and yet be able to employ the routed information without recourse to making notes.

Hoffecker.

The new instruments made by the Hoffecker Company, Boston, Mass., include model D, which has a 100,000-mile register and a trip register that may be set to zero at will by a side button reset, or to a tenth of a mile. Model H is a vertical type of combination clock and speedometer designed for use with cars of moderate cost. The other types have not been changed, save in minor detail.

Veeder.

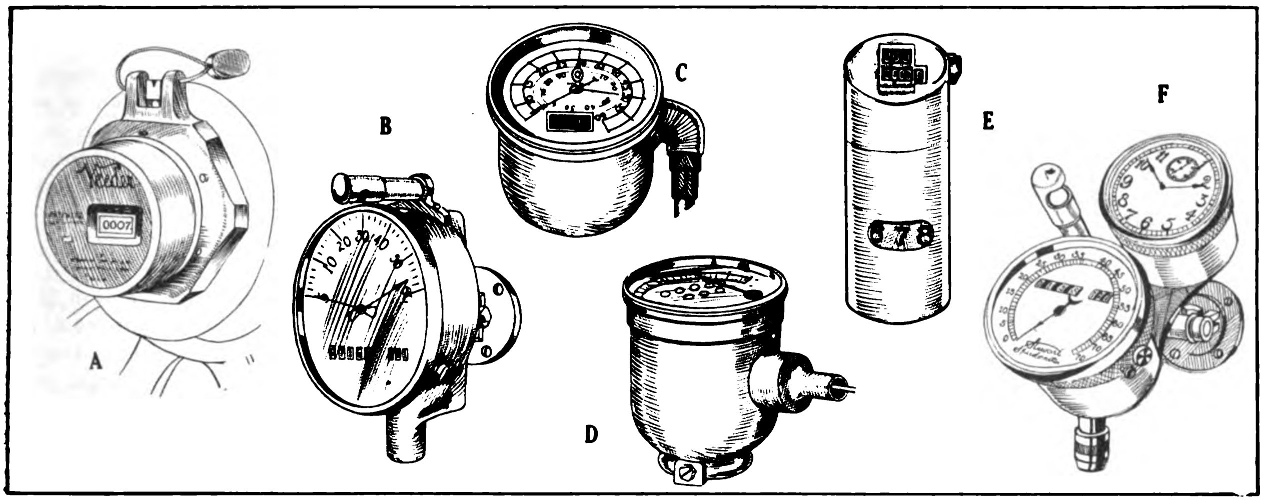
The Veeder indicator is made by the Veeder Manufacturing Company, Hartford, Conn., and with a tube containing colored fluid mounted in a metal frame carrying a scale. There is a reservoir for fluid and the momentum of a small centrifugal pump carrying this fluid upward into the tube indicates the speed of the car. There is a trip and season odometer, the assembly being operated by a flexible shaft from the vehicle wheel.

Forse.

Produced by the Forse Manufacturing Company, Anderson, Ind., this instrument has been improved by the change of the shaft opening to eliminate a turn in the flexible shaft. The type is centrifugal and the construction well designed, there being double ball bearings for the governor shaft, radial raceways and four point suspension. No springs are required for steadying the indicating hand. The drive is by a special cable of piano wire in a steel-lined brass tube.

Sears-Cross.

The 1912 model of the Sears-Cross, made by the Sears-Cross Company, New York, N. Y., is built with a double governor, the second functioning after a speed of 15 miles an hour has been reached, the one



Speedometers: A, Veeder; B, American Metric; C, Hoffecker; D, Forse; E, Casgrain; F, Stewart.

first used steadying the hand. The instrument as built is assembled within a case and this is installed within the housing. An odometer reset is a feature. There are six sets of ball bearings in the fittings.

American Metric.

Made by the American Eveready Company, New York, N. Y., these instruments are in 12 models and are of the magnetic type, the former centrifugal constructions being abandoned. They range from 50 to 80 miles an hour indication and vary in size and price. Besides these changes a swivel joint is now used at the steering arm and the flexible shaft has been decidedly improved.

Hopkins Electric.

This device, produced by the Electric Speedometer Company, Washington, D. C., includes a direct current generator geared to the vehicle wheel, a voltmeter, a commutator, an indicator, a revolution counter and an electrodometer. There are gold brushes for the commutator and the voltmeter, sapphire bearings and exceedingly accurate and careful construction. The electrodometer is for the use of the tonneau passengers. The record is of speed, distance, and travel in a given period.

Cleveland.

Made by the Cleveland Speed Indicator Company, Cleveland, O., this instrument is intended to register by indication speed averaged for each 176 feet of distance traversed, trip miles, actual running hours for the trip, average speed for trip or day, complete season's mileage, actual running hours for the season and average speed for the season. The indicator is a clock with registering device governed by a shaft driven mechanism, and it is self-winding.

Reliance.

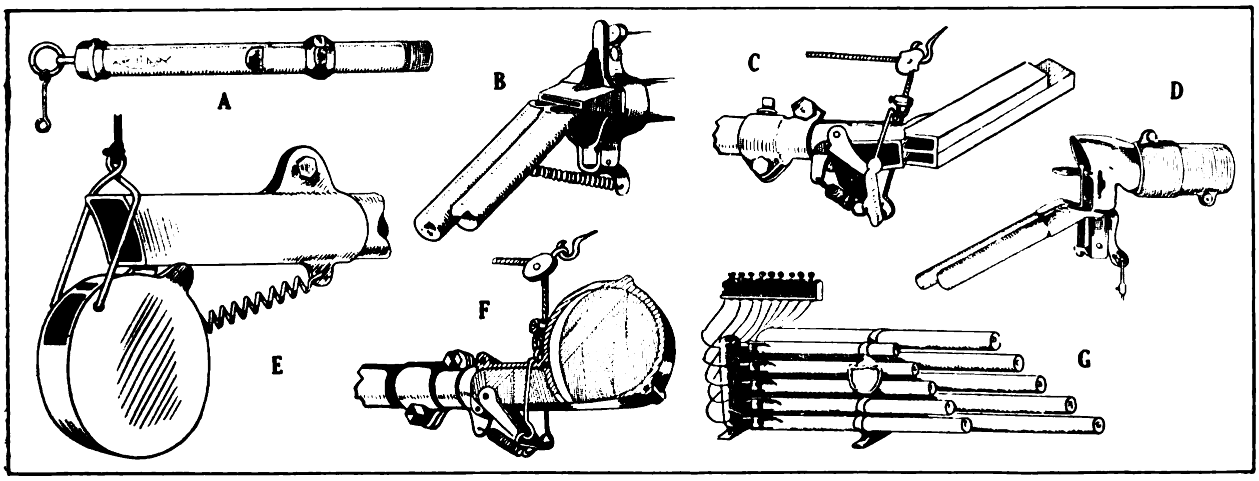
Produced by the Reliance Speedometer Company, Boston, Mass., extreme accuracy is claimed for these instruments through the use of a flexible driving shaft carried on ball bearings, which shaft has a swivel union at either end. All extreme movements of the indicating hand are eliminated by this shaft and mounting. The method of attachment is such that the driving pinion is always in the same plane as the ring gear on the vehicle wheel.

Casgrain.

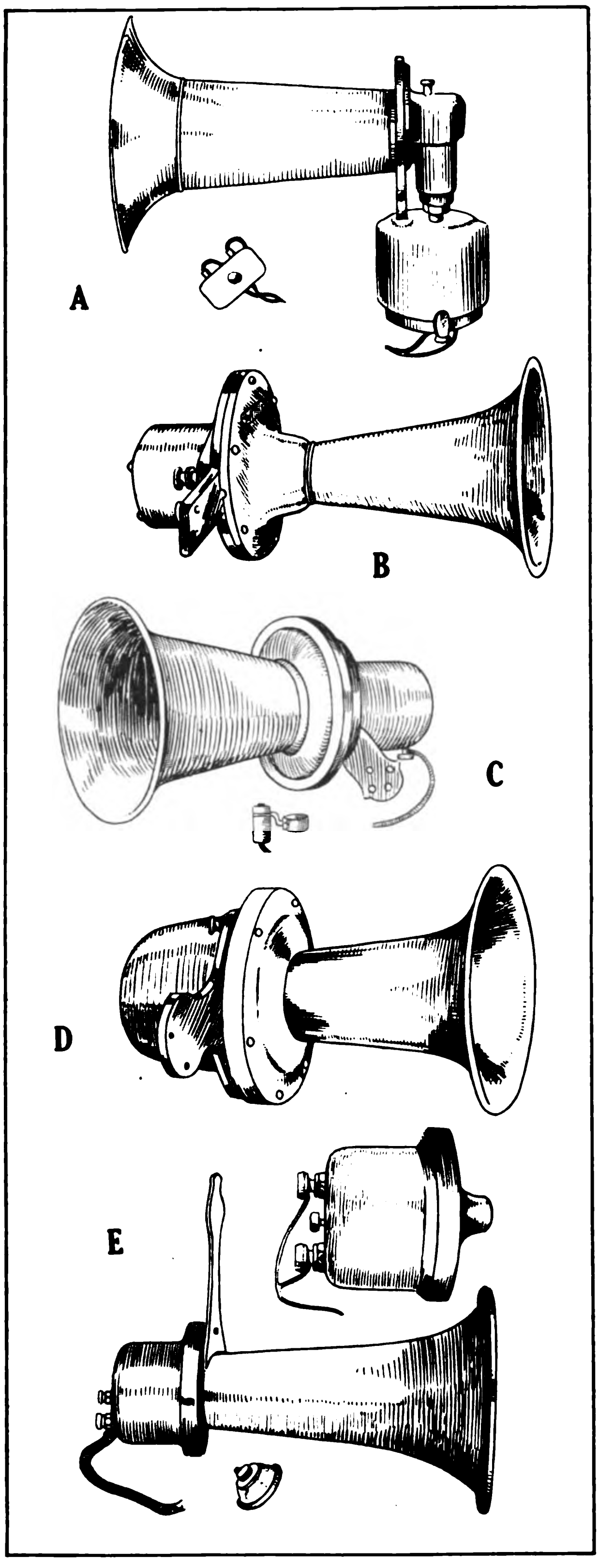
In this speed and distance indicator, made by the Casgrain Speedometer Company, Boston, Mass., the register is by figures carried on a cylinder that is actuated by the motion of the fluid contained within a sealed glass casing. The movement is by a rotary pump turned by a shaft driven by a flexible shaft from the front wheel. The device is carefully calibrated and as the shocks are cushioned by the liquid it is said that it is free of all influences that might in any way disturb its accuracy.

Troy.

The Troy Carriage Sunshade Company, Troy, O., produces the Troy pneumatic speedometer, which is actuated by an air draft forced through a flexible tube and which operates the indicating device. In a test, an instrument was driven 2508 hours at speed of 120 miles an hour, a total of 300,960 miles, and after this run by micrometer measurement no part showed measurable wear.



Exhaust Horns: A, Nightingale; B, Exo; C, Jubilee; D, Waymaker; E, Hough; F, Jericho; G, Gabriel.



Electric Horns: A, Klaxon; B, Oneita; C, Duplex; D, Hipwell; E, Typhoon, and Attachment for Bulb Horns.

Stover-Lang.

In the product of the Stover-Lang Company, Boston, Mass., the rate of speed, distance and time are recorded by a combination clock and recorder. A clock escapement is automatically wound by force of air driven through a tube every half-revolution of a wheel by a diaphragm. Every five seconds the wheel revolutions are counted and recorded. There are no springs, cams or magnets used in this device, which is claimed to be absolutely accurate.

HORNS AND SIGNALLING DEVICES.

While bulb horns are still offered, many concerns have turned their attention to the production of electrically or exhaust operated devices in addition to the older lines. Some of these present new shapes and designs, and taken as a whole the signalling situation has changed quite as much as any other in the so-called accessory field.

Sonora.

In the Sonora, made by the Sonora Motor Horn Company, New York City, the usual diaphragm has no button or stud riveted into the centre. Instead a little spring member beats against this drum head disc, producing a deep toned whistle. It is claimed that it may be operated an entire season on one set of batteries.

Newtone.

The Auto Supply Manufacturing Company, Brooklyn, N. Y., is featuring the Newtone Torpedo electric horn, in which the motor comprises a field of 75 laminated pieces. By the adoption of a vanadium steel diaphragm .03125 inch in thickness, it is claimed that the consumption of current has been reduced some 40 per cent. The same quality of construction is maintained in other members of the line.

Tuto.

The Dean Electric Company, Elyria, O., continues the Tuto horn, electrically operated, with which a button is attached to the steering wheel spoke, and the cord is encased in a fixture on the steering column. Pressing this button instantly causes the device to give forth a mellow note, while additional pressure brings about a more penetrating sound. An addition to the line is the Tutoette, a smaller replica of the Tuto, and a new bulb horn, known as the Tally-O-Horn.

Monoplex.

The Monoplex is made by the Atwater Kent Manufacturing Works, Philadelphia, being presented in three types, A and M for automobile service, and D for marine use. The operating button is clamped to the spoke of the steering wheel, and the principle of operation is that of a steel diaphragm being struck by an electro-magnetic mechanism. The sound thus produced is intensified by the bell of the horn.

Klaxon.

The product of the Lovell-McConnell Manufacturing Company, Newark, N. J., is almost too well known to need comment. Practically no change has been made in the Klaxon, but the Klaxonet is now offered as a combination instrument, which may be used as an electric device or as a bulb horn. For the first time the line is being offered in colors to match the cars on which the members are to be used.

Typhoon.

The Typhoon is produced by the Typhoon Signal Company, Chicago, and is a motor driven electric horn. The interior mechanism is new, and patent claims have been allowed, which the company holds is proof that it does not infringe upon any other device. In addition to the regulation Typhoon horn, the compartment containing the sound producing mechanism is furnished for attachment to the ordinary bulb horn if desired.

Hipwell.

An electrically operated horn, for which simplicity of internal mechanism is the prominent feature claimed, is the Hipwell Autophone, made by the Hipwell Manufacturing Company, Pittsburg, Penn. All working parts are sealed and water proof. Operation is by push button on the steering wheel.

Oneita.

The Mutual Auto Accessories Company of America, New York City, is placing in the market the Oneita electric horn, for which it is claimed that it has a tone 50 per cent. louder than usual. A large hammer vibrator is used, striking a 5.5-inch diaphragm, which, due to the peculiar construction of the casting, is held under considerable tension and causes the deep, clear tone. This casting is of solid brass, absolutely water and dust proof.

Duplex.

The Electric Auto Horn Company, Pittsburg, Penn., makes the Duplex, which operates from either the regular ignition or lighting battery, six-volt storage or six dry cells. The construction is held to be so simple as to present nothing to get out of order. With each horn is furnished a special steering wheel push button and three-way cable for connecting.

Jericho and Jubilee.

The Randall-Faichney Company, Boston, Mass., continues its Jericho exhaust horn with practically no change. This is installed in the rear of the muffler, either by clamping over the muffler stem by a double clamp coupling, or by screwing into the muffler by a threaded coupling. A simple pressure of a pedal gives a pleasing tone, clear and distinct, at any speed without racing the motor. This concern also makes the Jubilee, a chime horn, operated in the same manner as the Jericho.

Gabriel.

The Gabriel Horn Manufacturing Company, Cleveland, Ohio, has brought out a new form of its 10-tone Gabriel musical horn. Heretofore, this well known signalling device has been designed primarily for use on high powered cars, but the new instrument enables the owner of a 30-horsepower machine to utilize one of these as well. The line also includes musical signals of one or more notes, all operated by the exhaust.

Long Horn.

The G. Piel Company, New York City, produces the Long horn, operated by hand. Any volume of tone desired is said to be at the command of the operator, a sonorous and penetrating note being obtained instantly. The weight of the Long horn installed complete is about five pounds, which is cited as of special importance in selecting such equipment.

Clymax.

The Nonpariel Horn Manufacturing Company, New York City, presents the Clymax, an electrically operated signalling device. Within the rear end portion is placed a small electric armature, which a flow of electricity causes to rotate and drive forward four striking points, which hit the metallic diaphragm at three spots, set 120 degrees apart around the circumference. The point is that the action is not a continuous hammering on one place, but with this distributed over a series of places.

Exo.

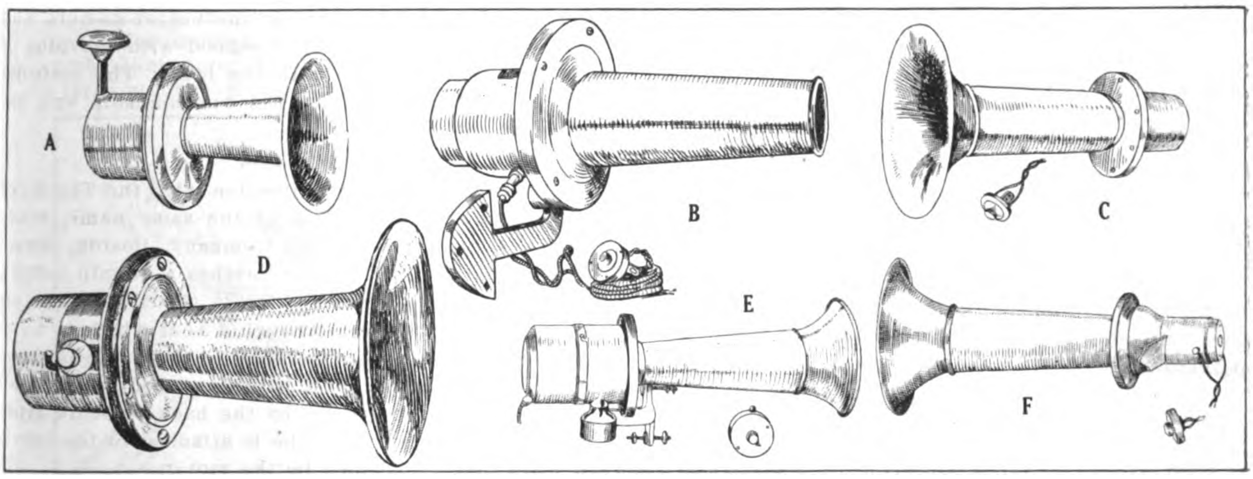
The Troy Auto Specialty Company, Troy, N. Y., makes the Exo, which is a double-toned exhaust horn, attached at the rear of the muffler. When in use the exhaust gases pass through the two pipes, giving forth a clear, well defined note. A spring pulls it back out of the way, when not in use.

Waymaker.

The Lee Tire & Rubber Company, Conshohocken, Penn., produces the Waymaker, a double-toned instrument operated by the exhaust. When brought into use by the depression of a pedal the exhaust gases are deflected by means of a centrally located valve, being thrown through a thick slot immediately across the ends of the chime tubes.

Nightingale.

The Nightingale whistle is made by the Riley-Klotz Manufacturing Company, Newark, N. J. This is an exhaust device, connected at the rear of the muffler, where it causes no back pressure and operates as well at low as at high speeds. The interior is designed so as to present a chromatic scale of bird-like notes.



Electric Horns: A, Long Horn; B, Newtone; C, Sonora; D, Monoplex; E, Tuto; F, Climax.

Hough.

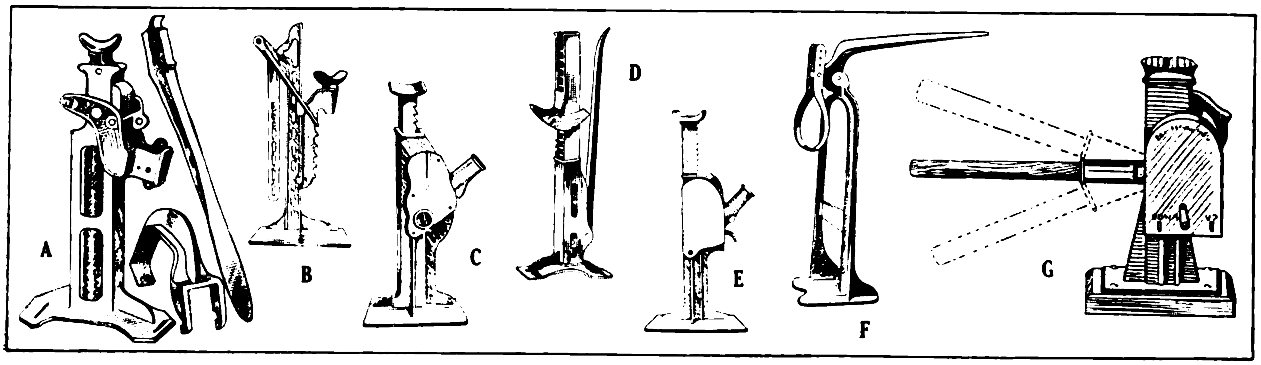
The Auto Improvements Company, Bristol, R. I., presents the Hough exhaust whistle, designed primarily for use on model T Ford cars. It is attached easily and quickly to the rear of the muffler by means of a tapered tube, which is split at one end and locked by a threaded bolt and nut. The other end fits over and partially closes the opening of the drum member.

JACKS.

One of the tools which are indispensable around the garage is a jack. Several forms have been in the market for a number of years and still continue to offer as good service as when they were originally brought out. A few new designs have been produced.

Hartford.

The Hartford Auto-Jack is produced by the Hartford Suspension Company, Jersey City, N. J. It is claimed for it that a pressure of 15 pounds on the handle will lift 1000 pounds on its rack. Gears, cut



Jacks: A, Peerless; B. Reliable; C, Miller; D, Oliver; E, Buckeye; F, Moore; G, Hartford.

from steel and hardened, ingeniously arranged, wonderfully multiply the little power applied to the long lever with its short stroke.

Raiswell.

The Raiswell, made by the Lovell-McConnell Manufacturing Company, Newark, N. J., has its entire mechanism enclosed in a neat housing, this being a series of gears. The only exposed portion is the thumb wheel on which fits the brace bit designed for turning these gears and lifting the load.

Barrett.

Barrett jacks, made by the Duff Manufacturing Company, Pittsburg, Penn., may be regarded as standard for motor car use. They come in four sizes, designed for light and heavy cars, trucks and general garage work. The construction is simple and compact, and the various models are as light as consistent with the work for which they are intended.

Oliver and Peerless.

The Oliver, made by the Oliver Manufacturing Company, Chicago, has a straight lift of 1.5 inches and locks by passing the centre. The bracket slides up and down on a standard and is instantly adjusted to any height. The same concern makes the Peerless, which not only is smaller in size but may be utilized in removing the tire from the wheel, by placing the bracket between the spokes of the wheel and using the handle as a tire tool.

Miller.

The Miller, produced by Chas. E. Miller, 97-103 Reade street, New York City, is a quick acting, automatic lowering jack, designed especially for automobile use, and is adapted to the factory or garage, as well as being so arranged as to be carried as a part of the regular car equipment. The construction is of the best material and every part is machine finished.

Reliable and Ideal.

The Reliable is made by the Elite Manufacturing Company, Ashland, O. With the Ideal, produced by the same concern, this line is fitted with swivel tops to permit of their being set in the most convenient position for operation. They are strong, compact and small, occupying very little space in the tool box, and yet large enough to do their work well.

Moore.

While J. C. Moore & Co., Racine, Wis., has brought out a full line of Moore lifting jacks, suitable for every class of automobile work, the new tire saving jack of this name is of particular interest. The loop is placed over the hub, and the handle pushed down until the car is lifted to the desired height.

Buckeye.

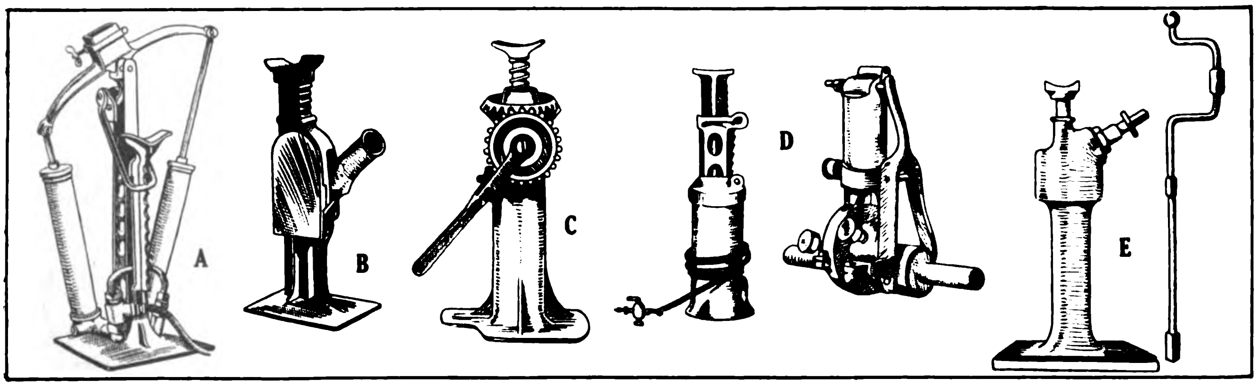
The Buckeye Jack Manufacturing Company, Alliance, O., is making a full line of Buckeye automatic jacks, which are intended for the use of owners who desire a safe, reliable tool, designed with the idea of not being able to drop with the load. The material is drop steel forgings, and the workmanship and finish is of the best.

Ten Eyck.

Designed for use in connection with the Ten Eyck tire pump, the lifting jack of the same name, made by the Auburn Auto Pump Company, Boston, Mass., is regulated so that when it reaches a certain height, the control valve of the pump is closed and the air from the pump escapes through a vent which is automatically opened. The operation of the pump is automatic, the driving clutch being engaged by a small piston which is forced up by the back pressure from the tire, the instant the tube is attached to the valve. Of course, it is operated by the motor.

Warner-Service.

Another combination jack and pump is the Warner-Service Jackpump, made by the Warner-Service Manufacturing Company, Jersey City, N. J. It is claimed that this device will lift the car three inches off the ground with one stroke of the lever. Connected with the jack are two high pressure compound pumps capable of delivering 60 cubic inches a stroke at a pressure of a 150 pounds. These cylinders are made of special heavy gauge seamless brass tubing, and the jack, yokes and levers are of the toughest malleable iron.



Jacks: A, Warner Service and Pump; B, Barrett; C, Ideal; D, Ten Eyck and Pump; E, Raiswell.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

DOUBLE IGNITION ON A PLUG.

A method of using two separate ignitions on one plug is shown in Fig. 1 A, and the device is easily made and not expensive. It consists of two resistance spark gaps mounted on a fibre base which is placed on the terminal of the sparking plug. The gaps are adjusted about five times that at the plug points, which can be very small, as the resistance of firing gas under compression is, approximately, about four times as much as atmospheric pressure, so that the spark will choose the path by the way of one resistance gap and the plug points, rather than by the two resistance gaps, and back through the other high-tension winding. The spark from either magneto or storage battery ignition will not be weakened appreciably by the extra gap, as no trouble is found with two plugs, one a double pole, in series.

BATTERY TERMINAL PROTECTOR.

Although the storage battery is not used so commonly for ignition in connection with the internal combustion motor as formerly, it is still employed by a large number of cars for that purpose, as well as for lighting. Terminals of this type of battery give trouble as they corrode, especially if the owner does not give them proper attention. A device that will not only aid in preventing the corrosion of these members and wires as well, but also prevent possible short circuits, is shown in Fig. 1 B. It consists of a piece of rubber hose through which the wire is passed and after the cable is attached to the terminal the rubber is slipped down over the terminal.

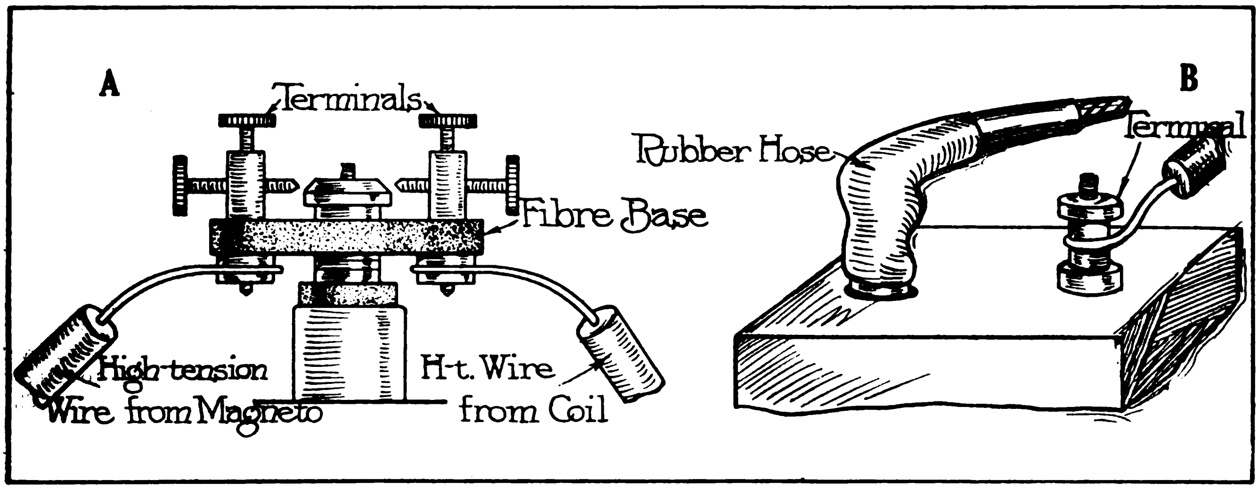


Fig. 1—Some Ignition Hints: A, Double Ignition on One Plug; B, Storage Battery Terminal Protector.

MAGNETIZED PLIERS.

A pair of ordinary pliers, the ends of which have been magnetized, are very useful and should be included in the tool kit. The expense attached to having the tool magnetized is very slight and any electrician can do the work. The pliers will be found very handy when extracting cotter pins and other small parts which will have a tendency to stick to them even if the grip be slightly relaxed. Another device of this nature which is handy around the garage is a piece of drill rod .125 inch in diameter, the end of which is magnetized. Sometimes in drilling blind holes there is difficulty in cleaning out the drillings which often means broken drills. By use of the magnetized rod the drillings can be removed. The tool can also be utilized for picking up small parts that have fallen into places apparently inaccessible.

AN EMERGENCY FILE.

A motorist who had occasion to replace a taper pin while on the road, discovered to his dismay that the tool kit did not include a file. The pin was slightly large and it would not do to force the member by driving. Having some emery cloth, the automobilist placed a strip about an inch wide on a flat piece of wood, with the emery side facing outward. Not having tacks or nails to hold the cloth, he cut a notch at either end of the stick, and by means of wires, held it in position. With this home made file he smoothed the taper pin to the required size, effecting his repair.

LOOSE SWITCH CONNECTIONS.

Loose connections in switches will cause skipping of the motor that is sometimes puzzling to locate. This is particularly true of that type of switch with the kick throw, that is, where the operator shifts the switch by means of the foot. This method imposes a strain upon the device which loosens it. It is a good plan to remove the switch occasionally and tighten the connections.

RADIATOR CAP REPLACEMENT.

While radiator caps are not often lost they sometimes are jarred loose by the vibration of the motor and if not attended to fall off and are lost. A road replacement can be effected by the use of a piece of chamois and string or wire. The chamois should be cut slightly larger than the diameter of the cap, placed over the radiator opening and the string or wire wound snugly around the ends.

WATER IN GENERATOR.

Certain types of gas generators give trouble, which is due to water in the tubing. The tubes should be blown out with the tire pump. It is a good plan to disconnect both the generator and lamps before cleaning the tubing.

SLIDING RING VALVE ENGINE.

A slide valve engine of ingenious design and extreme simplicity of construction, known as the Reno and of French origin, is shown at Fig. 2. The valve gear is in the form of a split ring H fitting closely in the cylinder and provided with a bearing block which is engaged by the rocking lever J, this in turn being actuated by the tappet K. The tappet is raised and lowered by means of a short bell crank, one leg of which engages the tappet and the other the double face or channel cam carried on a camshaft parallel with the crankshaft. To allow the rocking lever J to pass into the cylinder a slot is provided in the latter, which is always covered by an extension of the ring valve whatever the valve position. The split ring valve in its travel moves over the annular chambers L and M, which are cast in the cylinder wall and form the inlet and exhaust ports respectively, these being in communication with the inlet or exhaust openings E and F.

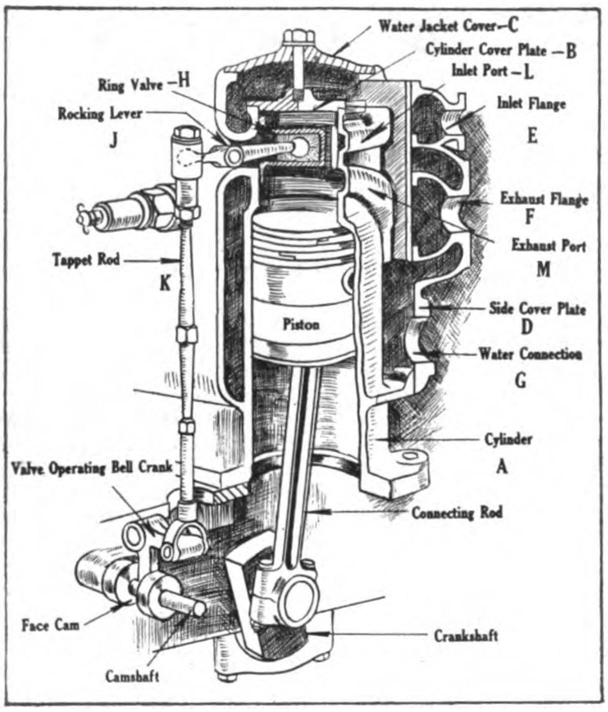


Fig. 2—Part Sectional View of the Reno Sliding Ring Valve Engine.

The diagrams at Fig. 3 show the valve in the induction, compression, firing and exhausting positions. The inlet port is designated by A, the exhaust passage by B and the ring valve by C. At 1 the inlet ports are uncovered, and the gas is entering the cylinders. At 2 and 3 both ports are closed by the valve while at 4, the exhaust is open. The principal parts of the engine are clearly depicted in part sectional view Fig. 2. A is the cylinder casting with the detachable head B, the central bolt of which holds the water jacket cover C. The side plate D carries the inlet union and chest E and the exhaust trunk and union F, also the water connection G. This valve system has been tried with satisfactory results on a four-cylinder car engine with a bore of 3.4 inches and a stroke of 5.2 inches. During the bench test this developed 28 horsepower at 1350 revolutions a minute, which was found to be its most efficient speed, and it was accelerated during the test up to 2200 turns a minute.

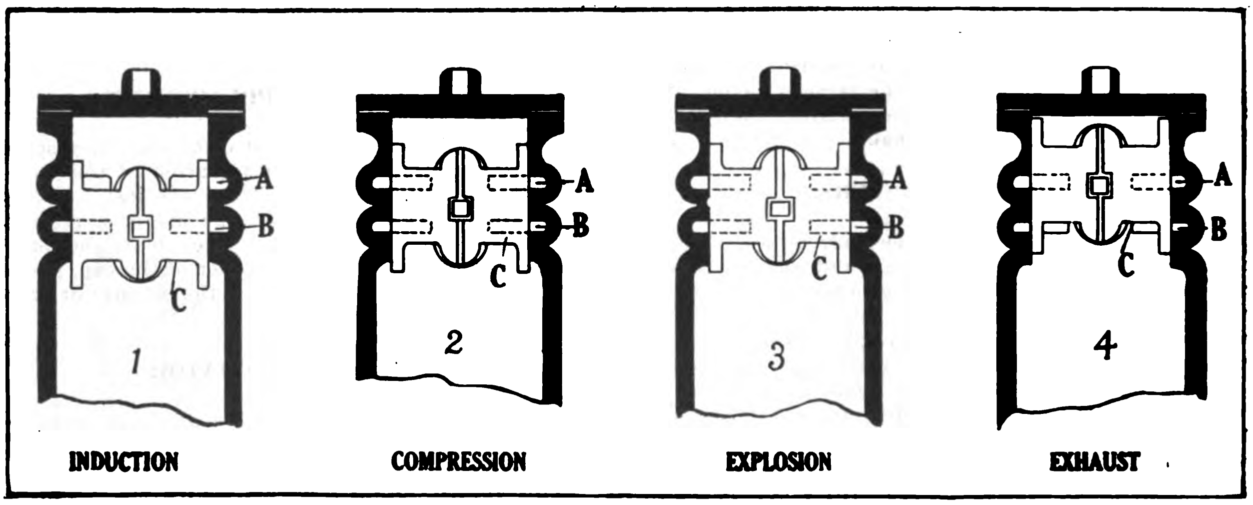


Fig. 3—Diagrams Illustrating Position of Sliding Ring Valve During Various Portions of the Cycle of Operations.

AIR IN WATER CIRCULATION.

One of the causes of the motor overheating is the water circulation system. An instance of this kind was noted recently by an owner who was at loss to account for the trouble as he had a few minutes previously refilled the radiator. The motor began knocking and became exceedingly hot, while the radiator was cold. It developed that there was an air pocket. The petcock on pump was opened and engine started. Circulation was restored after which the radiator was refilled.

Care should be exercised in adding water to the radiator. It should not be added before it has sunk low enough to expose the tops of any of the tubes. If the level be lower than this, the incoming water creates and imprisons a pocket of air in one or the other of the many narrow tubes in the system. It is natural to expect that the rush of water from the pump would force this pocket of air up into the space beyond the tubes in the radiator, but it often fails to do so.

If a replenishment is necessary, and the level of the water is below the tubes, the best method is to open the petcock at the lowest point of the circulation system, and drain off water, and continue to do so until a steady stream is pouring, to prove that the circulation is clear. It is then safe to add water and restart the motor.

Cutting Off Steel Shafts—The following little kink may be appreciated by many machinists who have had more or less trouble when cutting off steel shafts. By simply turning the cutting-off tool upside down, and running the lathe backward, it is possible to almost entirely eliminate any digging in of the tool. This method will be found to be far superior to the ordinary method of cutting off stock. Of course it works to better advantage when using a cutting-off tool. It is necessary that the lathe be reversed, or, if the cross-slide permits of the tool being placed on the opposite side of the lathe in the rear, then the reversing is unnecessary.

SIMPLE VALVE TRUING TOOL.

When overhauling gasoline engines, one of the essential operations invariably performed is truing and grinding the valves. If the valve heads are scored or have ridges in them, it is necessary to smooth the faces in contact before grinding to obtain a perfect seating, because the abrasive will get into the ridges and only intensify them instead of reducing them as is necessary. The valves are usually placed between centres on a lathe and driven at high speed, the high spots being turned off by taking a light chip off the face with a regular turning tool, or the roughness may be eliminated by using a file or piece of emery cloth if the grooves are not too deep. This operation should be performed only by a skilled mechanic however, and makes it imperative that a lathe be utilized. The valve seat must be trued to the same angle as it was when new in order to correspond to the seat in the cylinder.

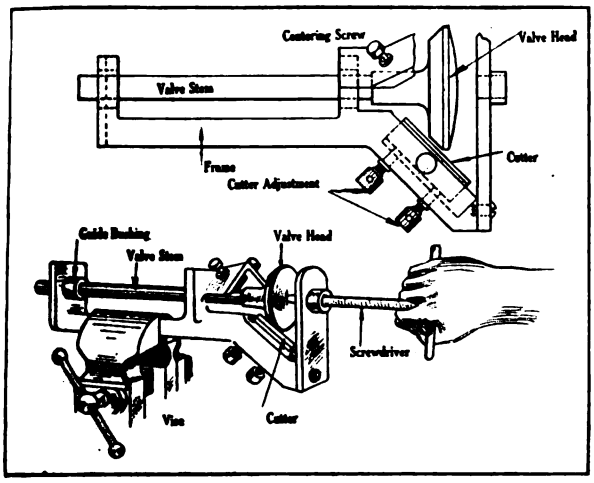


Fig. 4—Sargent Valve Truing Tool and Method of Application.

The simple tool shown at Fig. 4 is one recently patented by Allan Cameron Sargent, Lowell, Mass., and has been devised to make it possible to true up valve heads by hand. It consists of a forging or frame of metal having guide pieces for the valve stem and also acting as a support for the adjustable cutter against which the valve head is pressed and revolved by a screw driver or other suitable tool. Centring devices are provided and any size valve can be accommodated. The end piece that serves as a guide for the screw driver is removable to allow the valve to slip in place. Bushings may be provided so different diameter valve stems can be accommodated in the guide pieces. The cutter can be adjusted so the angle will conform to that of the valve head to be trued. The parts of the device are clearly depicted in illustration as well as the application, and the simplicity of the tool and the ease with which it may be used are apparent.

AN EASILY MADE EMERY GRINDER.

The equipment of the small repair shop or the private garage need not be costly and many useful tools and appliances can be made at very small expense by the motorist of average mechanical ability. J. D. Hopper describes an efficient and cheaply constructed emery grinder in the American Blacksmith. This utilizes odds and ends and which is not difficult to make, yet which would be of obvious utility to the man making his own repairs. His instructions follow:

"Take an old bicycle (drop frame preferred) and saw off top bar just in front of seat post. Saw lower braces about eight inches in front of hanger. Place it in a wooden frame and fasten as shown in the engraving. Take the rear hub and babbitt it or otherwise fasten it in the hub of an old cultivator, or similar wheel. This wheel must, of course, have a flat face for the belt. A wheel 30 inches in diameter can be used in most cycle frames. This wheel serves both as pulley and flywheel. The cycle should be geared about 66 to 70 to get proper speed for six-inch emery wheel. Place the wheel in the frame same as cycle wheel and use original pedals, cranks, hanger and chain.

"The emery stand may be bought or made from pipe fittings as previously described. By studying the engraving it can be easily seen how to complete this

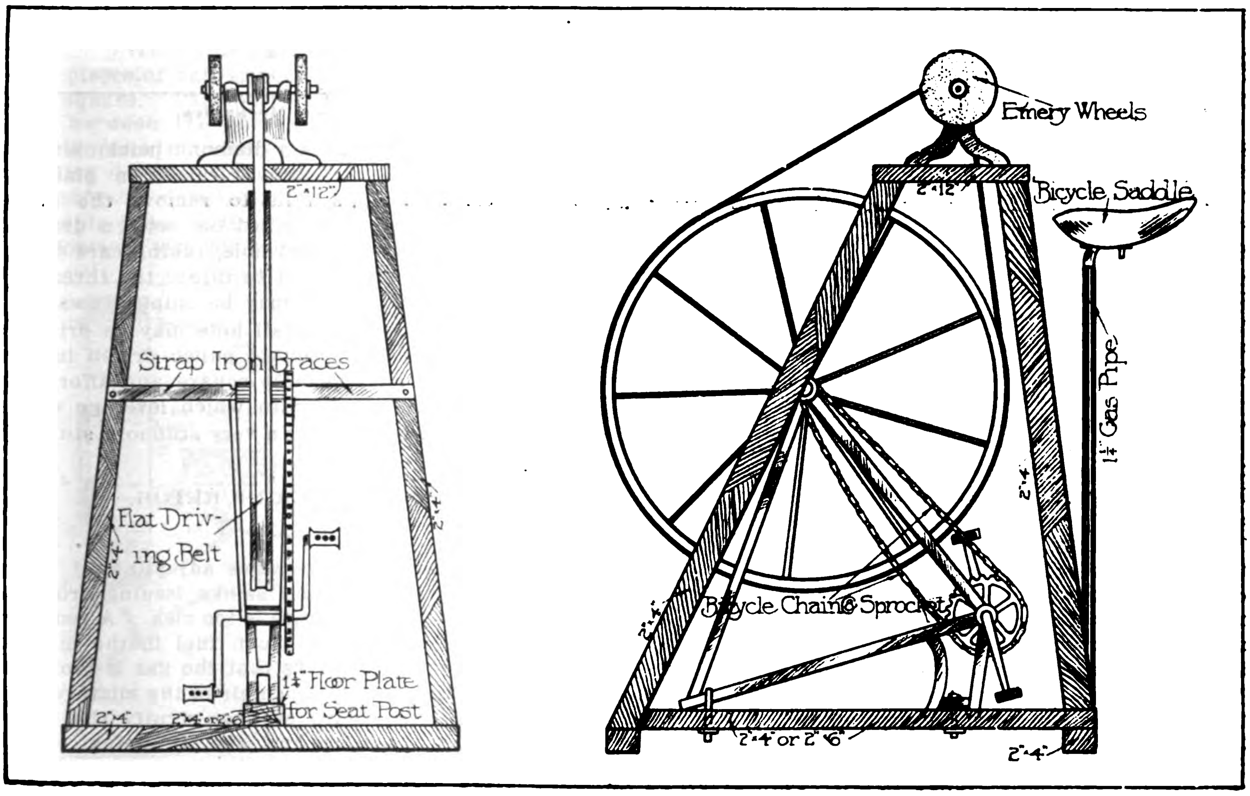


Fig. 5—How a Portion of an Old Bicycle Frame and Some Scantling May Be Converted Into a Power Emery Grinder.

machine, which will prove to be more efficient than any factory made machine on the market. I have used mine continuously for four years, and it has never been out of order."

SOME THREAD CUTTING KINKS.

The repair man often has occasion to cut left hand threads in nuts or on bolts and it sometimes happens that a left hand tap or die is not available at the moment. A right hand tap can be used to thread a rod to make a bolt or for tapping a nut with a left hand thread by observing a few simple precautions. The illustration at Fig. 6 A shows how to thread a rod with a right hand tap so it will act in the same way as a left hand die. Two holes are drilled in a piece of hard wood in such a manner that they cut into each other, the size of the hole being equal to the diameter of the piece to be threaded. The tap is screwed into one and held rigid, the other serves as a guide for the bolt or rod upon which the threads are to be cut, causing it to bear against the outside cutting edge of the tap. By turning the rod in a left hand direction a left hand thread will be cut, both the pitch and cutting edge of the tap being true enough for this purpose. Parallelism of threads will depend on operator.

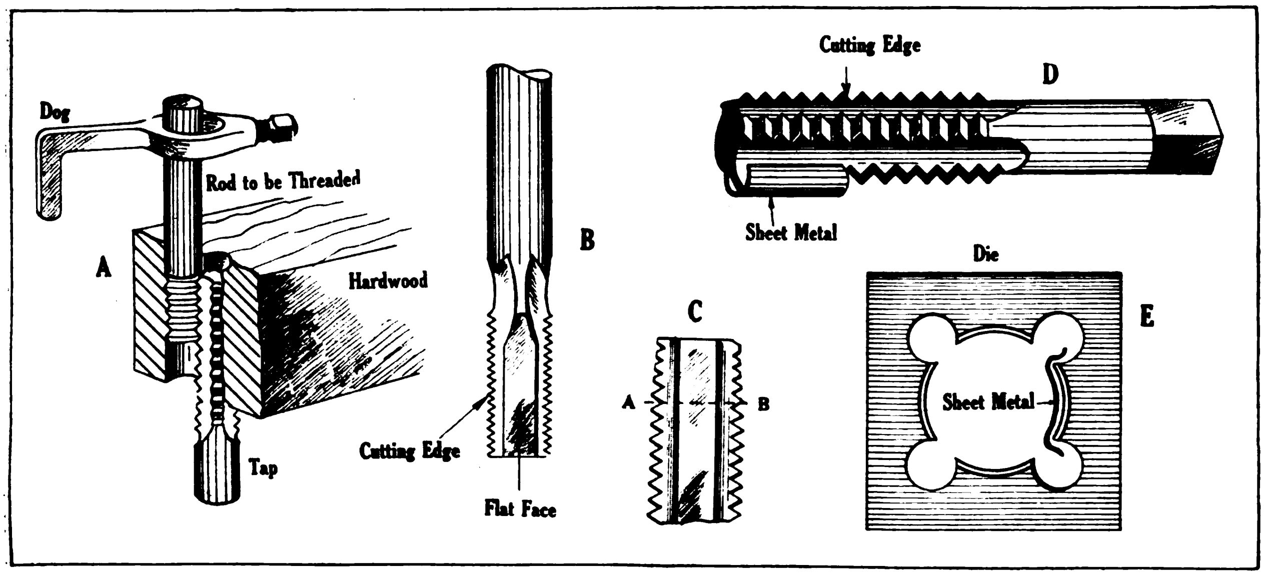


Fig. 6—Illustrating Simple "Kinks" on Thread Cutting Used by Practical Mechanics.

When the tap is to be employed in tapping out a nut, the alteration shown at Fig. 6, B and C, is necessary. A four-fluted right hand tap is changed into one having but two cutting edges by grinding off two of the flutes. On considering the remaining two cutting faces, it will be seen that the point of the thread on one side is on a line with the bottom of the thread on the other. This form of tap will cut either right or left hand threads depending upon the direction of rotation. Steel and brass, as well as cast iron, have been tapped successfully by this method.

After a nut is tapped, should it prove too small for the bolt it is intended to fit, it may be easily made larger. A small piece of tin is placed over the end of one of the flutes of the tap, as shown at Fig. 6 D. The tap is "run through" again and it will be found that the piece of tin crowds the tap to one side and cuts a considerably larger hole than before. If the nut should not prove large enough, another piece of sheet metal may be placed over the first one, which has assumed the contour of the threads.

If a solid die is used in cutting a bolt and the threads prove too large to fit the nut, a piece of light sheet metal may be formed and placed over one of the cutting faces, as shown at D, its function being the same as on the tap, namely, it forces the cutting edge opposite the piece to cut deeper.

GAS FILTERS NEED ATTENTION.

Some cars have a filtering device interposed between the fuel tank and carburetor. Its object is to catch dirt and water that may be in the gasoline. Filtering gauzes are also placed in the fuel pipe near the carburetor and these become clogged with sediment which results in the carburetor being starved of fuel.

It is a good plan to open the drain cock, of the filter near the gasoline tank occasionally and drain out all sediment and water, and continue to do so until clean gasoline appears. The filtering gauze near the carburetor should also be cleaned.

REMOVING BROKEN STUD.

The work involved in removing a broken stud is difficult enough when there is a bit left above the surface to afford a hold, but when the stud is twisted off flush with the top of the hole, the difficulties are increased proportionately. The best way to extract it is by making a slot across the face of the bolt with a cold chisel and use a screw driver to unscrew the offending part. If it is too firmly seated to yield to this treatment, the metal surrounding it may be heated and the stud well lubricated with kerosene. Then, tap close to the edge with a diamond point chisel and hammer, and the stud, unless rusted in place will usually turn. If this fails to remove the broken stub, it will have to be drilled out with a drill just the body size of the tapped hole, taking care to bore only in the centre so as not to injure the thread, the thin shell then remaining may be chipped away with a small cape chisel. A small hole may be drilled in the centre and a taper square punch driven into the stud, broaching out the hole square and affording a good grip for a wrench, with which leverage enough can be obtained to turn out a very stubborn stud.

ADJUSTING CARBURETOR.

When a carburetor requires adjusting, it should be remembered that black smoke issuing from the muffler indicates the mixture is too rich. A red flame also denotes there is too much fuel in the mixture, while a yellow flame shows that the gas is too weak, that is, that there is too much air in the mixture. Blue flame and a clear sharp exhaust signify the proper proportions of gasoline and air are being burned. Backfiring in the inlet pipe is also a symptom of weak mixture while a rich gas is sometimes indicated by explosions in the muffler.

MAKING PATCHES STICK.

The usual method of procedure after a puncture is to replace the defective tube with a perfect member. Sometimes the supply of extra tubes becomes exhausted, a not uncommon occurrence in touring. The motorist is then required to resort to patching the tube, which repair frequently is not effective due to haste in applying the patch before the cement is dry.

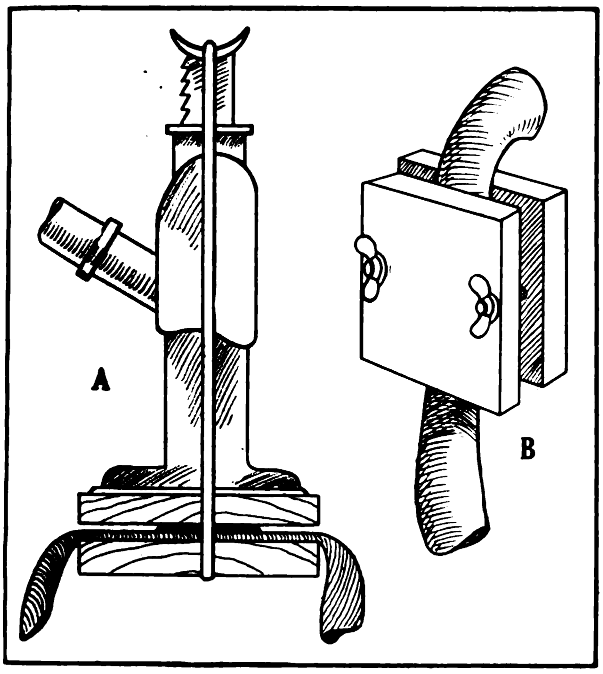


Fig. 7—Suggestion for Patching Tubes: A, Utilizing Jack to Secure Pressure; B, Home Made Tube Vise.

A certain length of time should elapse between each coat of the cement and the final coat should be allowed to dry thoroughly. Various methods of hastening the drying process are employed. It is essential that the patch be securely set before replacing the tube in the casing.

In the illustration appended herewith is shown a device for pressing the patch to the tube. It consists of two pieces of flat, smooth board about four or five inches square. That part of the tube with the patch is put between the boards, over which is placed a jack. A piece of wire or rope is then passed over the lifting device of the jack and carried down under the boards, as depicted in Fig. 7 A. By raising the jack ample pressure is secured.

A form of vise for the same purpose is shown in Fig. 7 B. It is made easily by taking two pieces of wood with smooth surfaces, about .5 inch thick. These members should be about five or six inches square. Holes are then bored, .375 inch in diameter, and two bolts, two inches or more in length, with nuts, preferably wing nuts, are used to draw the boards together after the tube is inserted as shown in the illustration.

USEFUL HINTS FOR REPAIRMEN.

It is not always easy to remove a key holding a flywheel or gear in place, though if it is a gib, as shown at inset in A, Fig. 8, a simple hooked member made of steel may be utilized as indicated. The hook, which has a rounded back, is placed between the head of the key and the hub of the wheel or gear, and a few blows with a hammer upon the other end are sufficient to start the key. The puller is made of tool steel, its size will depend upon that of the key to be removed. The method of pulling a key is also shown.

Protection for the speedometer driving gears is the object of the arrangement shown at Fig. 8 B. It is evident that there is considerable mud thrown on the mudguards from the tires and that drippings will get on the gears, causing rapid deterioration. The guard consists of an aluminum, brass or sheet iron cup that encloses the gears, and prevents deposits of mud accumulating between the teeth, as well as keeping small stones from being thrown between them and damaging the driving or driven member. The guard is easily made and attached and is adaptable to almost any make of car.

No class of workmen has the same difficulty in keeping hammer heads on the handle as those engaged in motor car repair work, or in general metal working. The constant jar of the head striking a non-yielding material inevitably loosens the wedge, which gradually works out and permits the hammer head to work off the handle. This tendency can be easily overcome by drilling a hole in the head, about .1875 inch in diameter, as shown at Fig. 8 C, and using a wooden wedge. Slot the handle for the expanding member, and after it is driven in tight, put an ordinary wood screw through. If a metal expander is used, it can be driven in place, and the hole drilled to include it as well, and the screw passed through into the handle just as though a wooden wedge was employed.

To temper knife blades of thin steel without warping, lay the blades between two pieces of iron, bolt together and heat to a cherry red, cool in rain water and draw temper by dipping the back of the blade in hot lead until you get a dark stone color on the edge, then quench.

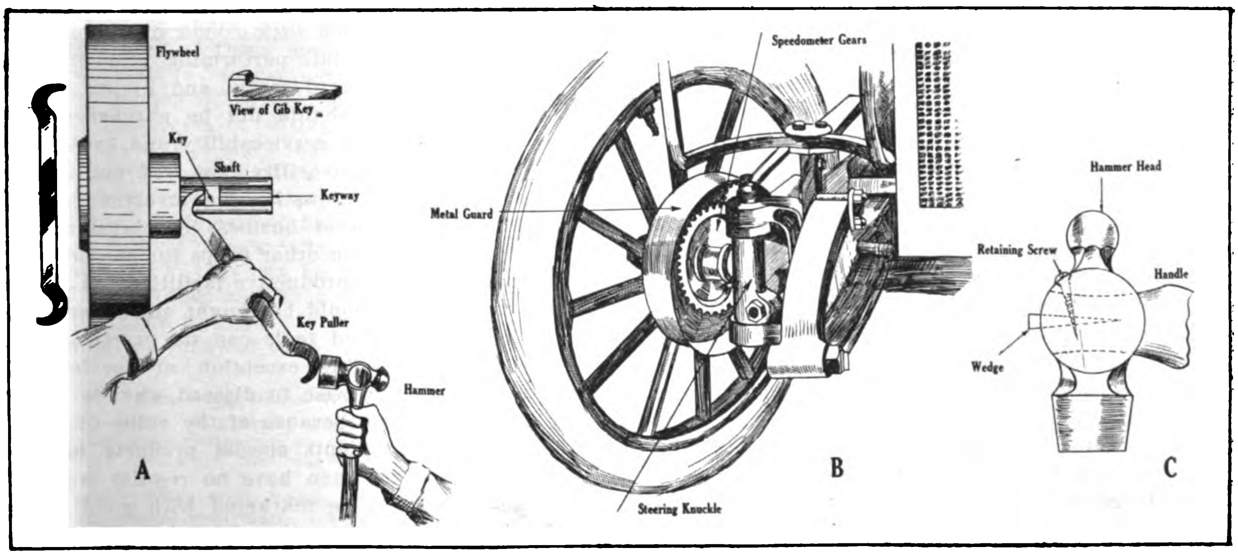


Fig. 8—Helpful Suggestions for Practical Repairmen Which Are Also Useful to Motorists.

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STANDARDS OF SPECIFICATIONS.

The makers of pleasure and service vehicles assume to give those interested detail relative to their machines that is known as specifications. Such data are supplied to meet innumerable requirements and may be much or little, complete or vague, according to the inclination of those preparing them. Some builders are careful in the preparation of the facts they give to the market. Others are extremely careless and neglect what is essential or important. Those who have to depend upon literature for their information cannot be satisfied with what is insufficient, nor can they be influenced by what is denied to them by those who should be chiefly concerned in obtaining the fullest publicity. Whatever loss may experienced because of negligence is borne by the manufacturer primarily, and such loss is another's gain. There is much to be gained and nothing to be lost by the issuance of standard specifications. The manufacturers and the distributors of cars must thoroughly understand this. Why not give some thought and attention to so important a subject?

ENGINE RATING BY DIMENSIONS.

The accepted rating for engine power is established by the formula of the S. A. E., which regards merely the cylinder bore. Without question this is uniformity, but many manufacturers maintain a greater power is developed with their motors than is indicated by the rating. No one will take issue with this contention, but what is true of the one is probably true of the others, especially when stroke and engine speed are quite as important factors as the bore. Some makers claim the maximum power, others the normal. As a matter of fact the formula rating is more or less disregarded or rejected. Power delivered at stated speeds on dynamometers that are recognized as standard would be the accurate and reasonable manner of establishing rating. It would be the more satisfactory method, and it would certainly create a value that could not be discounted nor discredited. The merit of such a standard in a competitive market cannot be over-estimated.

THE DEALER'S REFERENCE LIBRARY.

The season of the year when the motor vehicle owner most desires to complete his equipment is the spring. While he may have knowledge of what he may require it is by no means certain that he is familiar with every article that may serve his purpose. He may be advised by those not better informed than himself. The one reliable source of information available is the man with whom he does business. If the dealer is alive to his own best interests he will have filed for convenience whatever data he may have received to which reference may be made, and with the facts so classified the business man may be able to secure continuous and profitable patronage.

This means that there is a value to all publicity received and that this is governed by the valuation placed upon it by the dealer. He alone can make its worth much or little. Everything depends upon his realization of the possibilities or utilizing the information, while in these days of specialized quick delivery it is the equal of a much larger stock and consequently greater investment.

EQUIPMENT OF THE GARAGE.

The equipment of the garage or public service station must be equal to the demands made by patronage. It should be chosen with a view of economizing time, labor and material, performing and finishing any ordinary or standard work, and giving results that will satisfy. It should not be purchased with any other purpose than serviceability and endurance, and there should be no utility that will not in productiveness and saving justify the investment, with reasonable expectation of business development. It is better to depend upon other shops for special work rather than to have unproductive facilities. It is constant economy that should be sought and a resourceful mechanic with good tools can do practically all work, with the possible exception of special machine methods. It is wise to discard what is not in every way serviceable because of the value of space. With some establishments special products may be turned out when the men have no regular work on hand and these may be marketed with good profit, but this becomes merely a manufacturing proposition. The main thing is to attract patronage and retain it.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Proper Method of Using Cotter Pins.

(45)—Will you please tell me if there is a right and wrong way of fitting together a pin connection held with a cotter pin and washer, particularly if the pin is set vertically? I have had an argument over this with a friend and would like to have you settle it.

D. W. HOBEN.

Springfield, Mass., Feb. 22.

If the pin be set horizontally, there is no choice, as the head of the pin may just as well be on either side. In this case, the way to assemble is the most accessible one; that is, place the head opposite the least accessible side, so the cotter pin will come on the other, or accessible one.

When, however, the pin is set in a vertical position, it is advisable to set the head on top, as then the loss of the cotter pin and washer would make no difference in the action of the joint. The pin will usually stay in place until given a very severe upward jolt, something that seldom happens; in fact, cases have been known in which an uncottered pin of this kind went for months of hard driving without trouble.

If, on the other hand, the head be put at the bottom and the cotter on top, the loss of the latter allows the pin to drop out, in which it is materially assisted by the downward action of the force of gravity acting on the pin. If a loose fit, as most of such pin connections are, the pin will not stay in place a mile after the cotter goes.

Rejuvenating Dry Cells.

(46)—Will you please tell me if there is any method of treating dry batteries to renew their lost strength; that is, bring up the amperage so they can be used again? I have always thrown mine away when they gave out, but have been advised lately that they can be rejuvenated by some process, so as to make them fit for use again.

D. W. ALDRIDGE.

Corning, N. Y., Feb. 22.

There are several methods, no one of which can really be said to be very successful. The old cells can be stood on a high, dry shelf of a dark closet for a couple of months, when they will recuperate to a large extent the lost amperage. This is not permanent, however, and will be lost afterward fairly rapidly, more so than a new cell.

Another method is to punch holes through the sealing wax on the top, and then pour water or a a weak acid in onto it. This will soak into the dry powder within, loosening it up when caked, and helping a whole lot. Muriatic acid is good for this purpose. Cases have been known in which this "stunt" brought the amperage from three up to 18. Like the other method, this is but temporary, as the cell after "fixing" loses strength more rapidly than a new battery.

If either of these methods be used, they should be worked in connection with the mutiple-series wiring spoken of in the last issue and elsewhere in this. This form of wiring seems to build up a low amperage cell to the equal of the other cells, so that a few rejuvenated batteries may be used with a large number of new, good ones. The results from this combination are said to be almost equivalent to those from a full set of new cells. When the new ones grow old and weak, they can be rejuvenated or put on the shelf while other new ones replace them. Then when the old ones give out, their places can be taken by the shelf or renewed cells.

Renewing Gears Without Recutting.

(47)—Will you please advise me if there is any way in which gear teeth can be formed on a broken gear, to allow of use only for reaching home? I refer to the case of a friend of mine, who, while out on a long tour and many miles from home, stripped four teeth off one gear in the transmission. He had access to a blacksmith shop, there being no repair shop within miles. Finally, he gave up and rode home by train, for an extra gear, then went back the next day, replaced the broken one, and drove home.

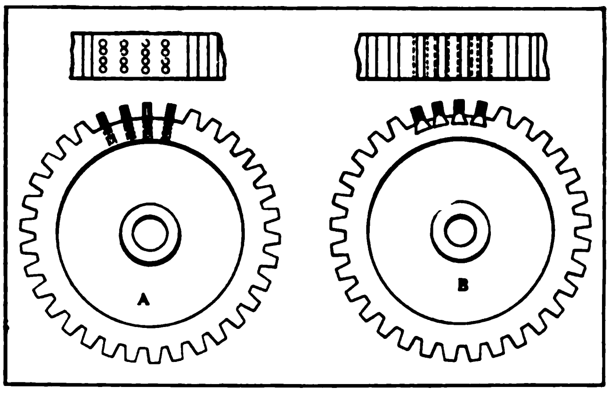
J. L. DUVEEN.

Hackensack, N. J., Feb. 21.

There are several ways in which your friend might have fixed up the broken gear well enough to get him home, after which he could secure a job as elaborate as he wished, even to a new gear. Two of these suggestions are shown in the accompanying sketch. In this, A depicts a gear with rows of pins screwed in place, these forming four lines across the face of the gear and being about the same diameter as the thickness of the teeth at the top.

If a tap and die are available, this is not a difficult job as compared with riding home and back by train, while the material and tools would be available in practically any blacksmith's shop. If not, the same scheme could be followed, driving the pins into place rather than threading them in.

The second sketch, B, shows how the same job is accomplished using a series of wedge shaped pieces to form the individual teeth. Undercut slots would be cut across the gear, where the teeth are broken off, and then the four pieces forged up to fit them. By driving in from the side and peining over the metal at the ends to prevent them from backing out in either direction they can be used for some time.



Two Methods of Temporarily Renewing Gear Teeth, When Several Have Been Broken Out.

To Color Brass Dark Blue.

(48)—In a recent issue of your publication I noticed a formula that would turn brass a dark blue. It was as follows: Copper carbonate 6.4 ounces, ammonium hydrate 3200 cc, water 1600 cc. Now I have been unable to find out what ammonium hydrate is after careful search and would thank you to inform me on the same. Any special directions you could give as to its application would also be appreciated as I want to use this on my lamps.

C. F. NUTTER, M. D.

Nashua, N. H., March 6.

Ammonium hydrate is nothing more nor less than the commercial ammonia or spirits of hartshorn as it was formerly called. It can be purchased almost anywhere for about 10 cents a pint. Clean the parts to be colored very thoroughly, making sure that no grease and oil adhere to them. This can be done with gasoline, or with kerosene and then gasoline. When clean, dip the brass in the solution and let it remain there for about 10 minutes, or if this be impossible, wash the parts over with it as frequently as possible for a space of say 15 minutes. When this has been done, wash in clear, running water.

Materials Used in Anti-Freezing Solutions.

(49)—Will you please tell me the composition or nature of the various substances used in the making of anti-freeze solutions? I do not care to have you give me a table of the temperatures of the mixtures, or anything of that sort, just a description of the chemicals used and their action on various substances.

FRED A. FRENCH.

New Britain, Conn., Feb. 16.

The following information relative to the most generally used chemicals, alcohol, glycerine, calcium chloride, will doubtless answer the purpose:

Alcohol is prepared by destructive distillation of various vegetable substances which contain starch or sugar, such as potatoes, beets and numerous grains and fruits. Any starchy material will serve for the production of alcohol and the real question is one of cost, which varies with the locality in which the manufacture is carried on. It mixes readily with water, and does not congeal at any known temperature, though its boiling point is about 175 degrees Fahrenheit, and above this point evaporation is rapid. It is a very volatile liquid and will evaporate at very moderate temperatures. The alcohol generally used is denatured by the addition of a substance which renders it unfit for drinking purposes and because of the recent removal of the government tax it may be obtained for about 60 cents a gallon.

Usual Number of Piston Rings.

(50)—What is the standard number of piston rings for an automobile engine? I have an old motor in which but three are fitted, while a friend with a similar sized modern machine has four. In arguing over this, I raised the point that the greater number of rings increases the amount of internal friction, and thus lowers the power. Am I right in that contention?

HOWARD C. DAVIS.

Stamford, Conn., March 5.

There is no standard, although motors usually have three up to four inches in diameter and four above that size. The contention as to power lost by the larger number is only partly correct; more rings with great stiffness would cause some loss, but this would be so small in amount as to be comparatively insignificant. This being the case, the number would have a very minor influence upon the power developed. This, on the other hand, would be more than offset by the increased compression resulting from the use of the greater number. It seems to be the modern tendency to fit many rings.

Home Made Distilling Apparatus.

(51)—I have an electric car with the old lead type of batteries, which use up a great amount of water in the electrolyte on account of the necessity for frequent refilling. The battery people advise me that they will not be responsible for the results, unless I use pure water for this purpose. Will you please advise me of some way in which I can purify ordinary water from the city faucet, so as to be able to utilize that?

DEWITT R. THOMASON.

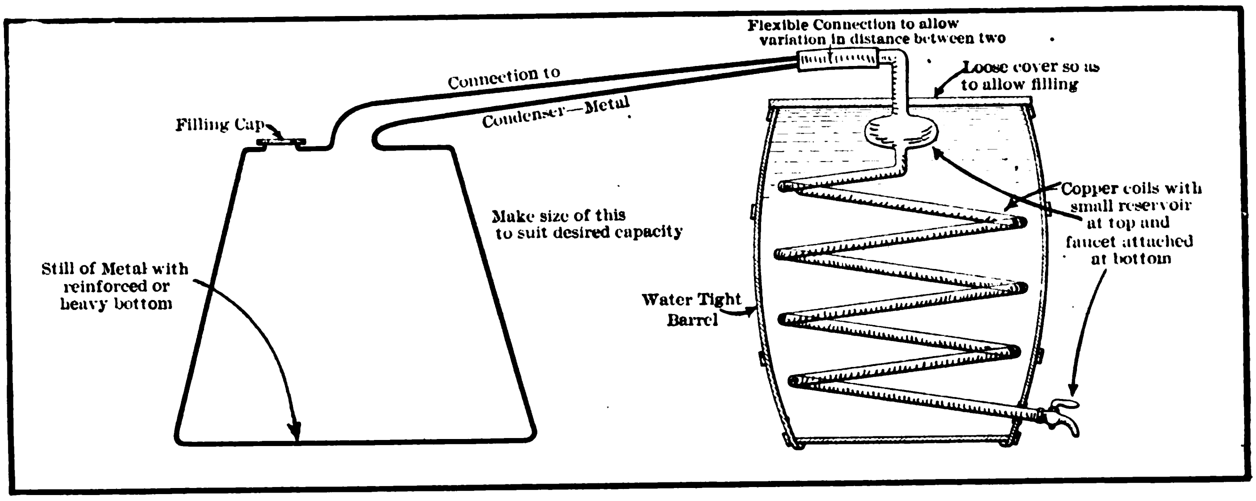
Chicago, Ill., March 1.

Pure water is obtained by boiling any available liquid, and condensing the vapor. This process eliminates all impurities from it, and if carried out in a careful manner, and repeated several times, almost chemically pure water may be obtained. For commercial purposes, however, this repetition would be unnecessary as the single distillation would purify it enough.

A simple apparatus which can be constructed by anyone in a short time is shown in the accompanying illustration. For this, obtain a stout barrel, and a coil of pipe, preferably copper, fitted into it in such a manner that the water surrounding the coil and filling the cask has no possible communication with the interior where the distilled product will come through. The only other need is a kettle or still in which to boil the water, this being of such capacity as to make frequent use of it unnecessary.

To utilize the outfit, fill the tank with water and start the fire. As soon thereafter as possible, fill the barrel with cold water, or arrange for running the same through it continuously. If the distilled, pure product must be kept on hand or retained for any time, it should be preserved in bottles with ground glass stoppers, as otherwise it will absorb impurities from the atmosphere, which will nullify the work of condensation. The best way is to make only what is needed at the immediate moment.

After a few trials, it will be found that the operation of the apparatus is simplicity itself, requiring only the filling of the still and kindling the fire.


Flexible Connection to allow variation in distance between two
Loose cover so as to allow filling
Connection to Condenser—Metal
Filling Cap
Make size of this to suit desired capacity
Still of Metal with reinforced or heavy bottom
Water Tight Barrel
Copper coils with small reservoir at top and faucet attached at bottom

Outline Sketch of Still and Condenser for Making a Supply of Pure Water, Depicting Pipe Connections; in Fact, Everything But the Fire.

Gasoline Engine Flywheels.

(52)—Will you please advise me how the limiting size of flywheels for automobile engines is determined, and what would be the objection to changing the size now on the motor to a larger and heavier one? It is an old car and the engine balance is so much out that I want to put on more weight, and in such a way as to get the best results. Can you give me any assistance in this matter?

GEORGE W. DOOLITTLE.

Boston, Mass., March 3.

The diameter of a flywheel in such a case is limited usually by the space into which it must be put, as the distance between the two parts of the subframe, while the rim width is kept down by the permissible length. The high speed of the engine brings about a big rate of travel at the rim, so that if the enlargement is too great, bursting may result.

The permissible tensile strength of cast iron, the usual material, is but 10,000 pounds a square inch, which with a factor of safety of 10, not too high for this material, gives a rim limiting velocity of 6085 feet a minute. This would keep the revolutions down to 1368 a minute, which being too low for ordinary engines causes a lowering of the factor of safety to give the turns desired.

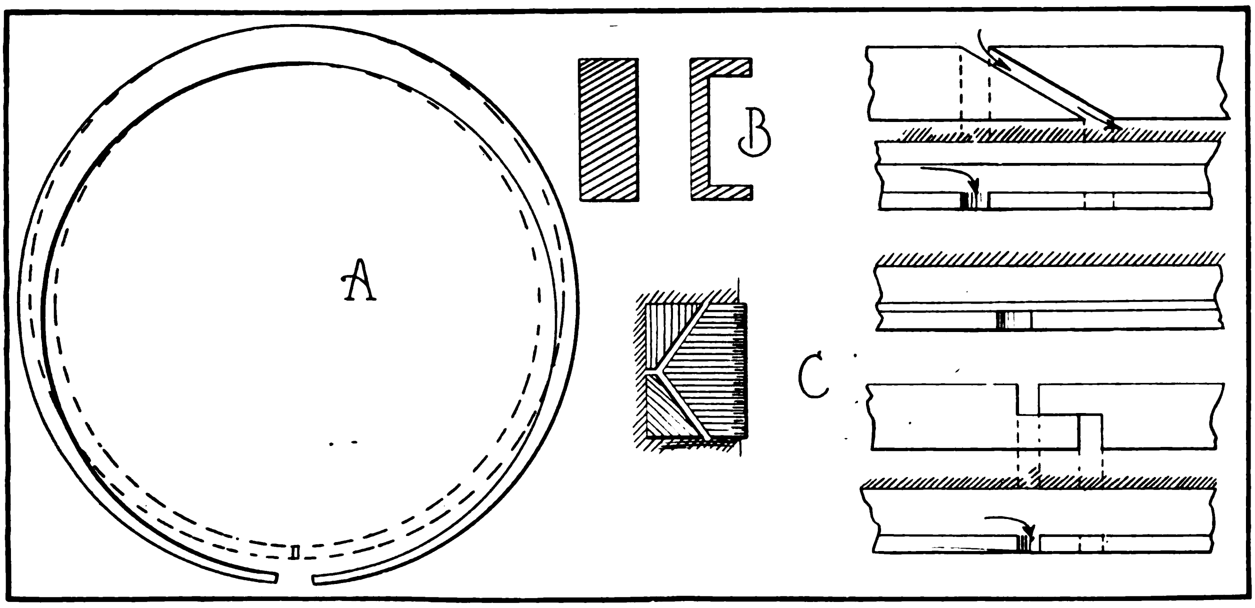
If a sub-frame or other parts limit the diameter, the width of face can be increased, or should that be kept down in any manner, the rim thickness can be made greater Either one of the latter is satisfactory, and the weight should be put on in several trials, if this can be done without objectionable expense, adding not over 25-30 pounds at a time.

Information On Piston Rings.

(53)—We are very anxious to have some good, reliable information on the subject of piston rings, so write to ask what is the best ring to your knowledge? How much pressure in pounds should each good ring exert on the cylinder wall, and what is the best method and instrument for determining this? Is a strong, stiff ring most beneficial for holding compression in the cylinder head and can the same be too strong, so as to score the wall? How weak can a ring be and still hold the pressure? Are additional precautions taken in the construction of these parts for racing cars?

C. W. & C. FOUNDRY CO.
Muskegon, Mich., March 2.

There is no such thing as a perfect piston ring, therefore there can be no best, at least none upon which an agreement would be found. The form most used is the eccentric, in which the width tapers from a very narrow edge at the cut to the extreme size at the back opposite this point. This results in a ring of uniform spring, those ends which are forced to contract and expand being the smallest in section and thus most easily compressed or allowed to extend. In the accompanying sketch, A shows this, the solid line depicting the open ring out of the cylinder and ready for use, while the dotted portion indicates the same when compressed into position within the cylinder. This brings out clearly the method in which the spring is obtained, as well as the tapering section.



Sketch of Piston Rings, Showing at Left, Usual Form, Open and Compressed; in Middle, Various Shapes of Joints, and at Right, Some Sections.

In machining, both outside and inside are turned to exact circles, the full circle depicting the normal condition, the opening being cut out after finishing. This form has the section shown at the left of B, that at the right being a new English shape, for which great things are claimed. It is said of this that the spring is greater with equal strength, while the weight is but slightly more than half. The latter multiplied by 16 (four rings in each of four cylinders) should have a large and favorable effect upon the running balance of the motor.

At C, on the right, are seen a number of methods of cutting the ring. Practise in this respect varies, although it is thought that there are more diagonals, like that at the top, than any other. In this form, the gas may leak through the cut, as indicated, there being an opening clear across the ring at the thin edge. This has been avoided by placing a pair in a groove with the thick edge of the outer one opposite the cut of the inner. Thus, while there is a small space inside the latter, there is none between the two, and no gas can leak through. A top view of this construction is shown in the middle figure.

At the bottom is seen a step or lap joint as it is variously called. This has the cut made in two sections, so that an extension of half-width is formed on each end, these being of equal length. When the ring is sprung into place, these almost meet, but a small half-width hole is left at the top on one side and the bottom on the other. The space behind the ring connects the two, so there is possibility for leak here also. This, too, is sometimes avoided by the use of two in a groove, one the inversion of the other.

The section in the middle of the drawing shows a ring made in three parts. The object of this was to make a more uniform, more springy type which absolutely would not leak. A pair of small members of triangular section occupy the inner, upper and lower corners, and present faces tapering towards one another. The outer or wearing part has a flat exterior, but a tapering interior to fit against these. The inner ones exert pressure on the outer and that in turn, upon the cylinder walls. It is good, but expensive.

Racing engines and aeronautical motors are usually altered to save weight, the rings being lessened in numbers and stiffened to make up for this. Sometimes, a compound fitting takes the place of all others, as on the Gnome rotating engines of seven and 14 cylinders, where a single compound ring answers for each piston.

Other things being equal, it is generally considered that as weak a ring as will hold the pressure is better, for this consumes less of the engine power in frictional losses.

Why a Mixture Backfires.

(54)—Will you please advise me why it is that a weak mixture will backfire when a rich one will not, that is, what is the theory of action in this case?

J. R. COYLE.
Fall River, Mass., March 2.

A weak mixture is one which contains too much air relative to the amount of gasoline vapor present. Such a mixture fires more slowly than does either a rich one or a vapor which is exactly correct. The latter will explode most quickly, the overrich combination next and the lean mixture slowest.

When a spark is produced in a mixture which is too weak, there is a tendency to do one or two things;

either not explode at all but burn instead, this being continued through the engine, exhaust manifold and sometimes muffler, or the igniting spark will run through the mixture in the opposite direction; that is, pop back in the carburetor.

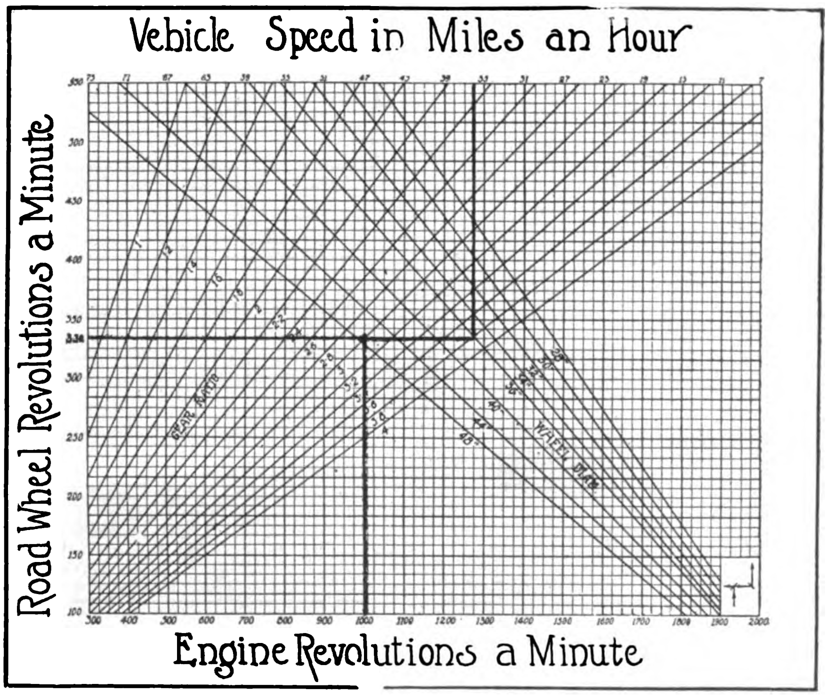
The former action causes what is called a muffler explosion, the slow burning gases carrying on their action until in the muffler they meet with additional gas, which takes fire rapidly and causes an exploding noise. This latter action may also be produced by running with a rich mixture but no spark, thus filling the muffler with combustible gas. Then a stroke or two which is properly sparked will carry flame to this unburned gas, causing an explosion there.

Handy Speed Chart.

(55)—Will you kindly give me a list, a chart or table which will show at a glance the speed of the car, when the engine turns and gear ratio are known? I find that such would be very useful to me, as well as a number of friends, since at present we are obliged to figure out each case separately. A proper form of table or chart would allow of taking these off by inspection.

W. H. SONNSCHEIN.

Boston, Mass., March 5.



Speed Chart from Which Either Road Wheel Revolutions or Miles an Hour May Be Obtained, Knowing Engine Revolutions, Wheel Diameter and Gear Ratio.

A chart is appended herewith which gives all that is asked by the subscriber above, and in addition several useful items. To figure the vehicle speed, it is necessary to know the engine revolutions, the gear ratio and the wheel size, not the two former alone, as mentioned above. Having these it also is possible to determine the road wheel speeds.

To explain the chart: The engine revolutions are laid off on the horizontal base, from the right hand corner of which a series of diagonals represent the wheel diameters. From the left hand lower corner another set of diagonals indicate the gear ratios. At the left side, the vertical units represent wheel revolutions, while at the top will be found the vehicle speeds. To use: Start with the engine speed, follow the line indicating this vertically upwards until it intersects the gear ratio inclined line. By following that to the left margin, the wheel revolutions will be given, while following it to the right will intersect the wheel diameter. Thence, a vertical to the top will result in the desired quantity.

An example is worked out in heavy lines. This is for the following data: Engine revolutions, 1000 a minute; three-to-one gear ratio, 46-inch wheels. Followed through, as indicated, this gives 36 miles an hour, and incidentally, 330 turns of the wheels.

Oil and Kerosene Mixtures.

(56)—Will you please advise me whether it is necessary to drain off the oil from the crankcase when cleaning out the carbon with kerosene?

A. M. De GRUCHY.

Newark, N. J., March 3.

It is advisable but not necessary to drain off the oil, when cleaning the carbon out in this manner. If the crankcase is not drained, the kerosene will mix with the lubricant, diluting the same. While oil is a good lubricant, kerosene is poor in this respect and should be used only in cases of absolute necessity.

The case should be drained clean, and the drain cock left open so the kerosene can drain through. This will serve the double purpose of cleaning the case as well as the cylinders. The carbon removal process having been completed to the owner's satisfaction, clean, fresh oil may be put back in the case.

Installing a Steam Power Plant.

(57)—I have a job of placing a steam power plant in a gasoline chassis, and would like to have some help as to the location of the various parts. The burner is similar to the Borg and has the porcupine type of boiler. How should this be placed; that is, how much space left between burner and boiler, and how should it be jacketed? It is a second hand outfit and no directions are furnished.

J. E. WHITMORE.

Scranton, Penn., Feb. 29.

Of necessity the placing of all the parts will depend upon the amount of available area left by the gasoline engine. In this will enter the width between the two sides of main or sub-frame, the height of the bonnet at the centre and sides, also the length from front end to dash. It is barely possible that this will be so limited that some of the parts will have to be located beneath the floorboards.

The burner should be slightly more than three inches below the lowest tubes of the boiler, this forming the combustion space. It would be regulated best from the burner and boiler used, the distance varying to give the quickest steaming and best all around results. The boiler should be covered with sheet iron and that in turn, jacketed with about an inch of asbestos pipe covering plaster. This material comes in the form of a coarse, stringy powder, which combines with water to form a cement like plaster. When mixed, this is applied with the bare hands, shaping the same as it is put on. With care a neat, smooth surface may be produced.

For more specific information, it would be desirable to apply to some concern which is still making this type of car. The following are recommended: The White Company, Cleveland, O.; the Stanley Motor Carriage Company, Newton, Mass., and the Lane Motor Vehicle Company, Poughkeepsie, N. Y.

Preserving Drawings—To preserve sketches in pencil or working drawings in India ink, an authority advises a coating of photographer's collodion after two per cent. of stearine has been added to it. The drawing is laid on a sheet of glass, marble, or other smooth surface and the mixture poured over it and spread over its surface with a soft brush. The liquid dries rapidly, and after 15 or 20 minutes the drawing is perfectly dry and white.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to manufacture or deal in motor cars, accessories, etc.:

General Automobile Company, Boston; capital, $15,000; incorporators, Leonard M. Cotton, Herman P. Bell, Lemuel W. Peters.

Rowan Automobile Company, Dover, Del; capital, $5100; incorporators, Ludwig Isenberg, David Isenberg, Oscar Isenberg, all of Philadelphia.

The Burgner-Cade Auto Company, Veedersburg, Ind.; capital, $6000; incorporators, D. S. Cade, J. W. Burgner, O. E. Cade.

Buffalo Auto Novelty Company, Buffalo, N. Y.; capital, $5000; incorporators, George A. Orr, Donald S. Carroll, Henry L. Jauch.

Taylor Motor Company, Lynchburg, Va.; capital, $25,000; president, T. A. Jennings; vice president, R. C. Taylor; secretary, H. P. Taylor.

Cobb Motor Company, White Plains, N. Y.; capital, $5000; incorporators, Frederick W. Cobb, J. Oakley Hobby, Jr., Arthur L. Strang, Frank J. Lamb.

Mohawk Garage Company, Brooklyn, N. Y.; capital, $50,000; incorporators, B. J. Roesler, Jr., A. M. Roesler, W. Roesler.

Lichty Sales Company, 602 Blackhawk building, Waterloo, Ia.; capital not given; H. F. and O. Lichty, owners and managers.

Edwards Auto Company, Watertown, N. Y.; capital, $7000; incorporators, Frank H. Edwards, Rose E. Edwards, Ross C. Brimmer.

Universal Motor Car Company, Pittsburg, Penn.; capital, $10,000; incorporators, Jacob W. Kennedy, Harry A. Cornelius, William M. Carleton, Harry E. Weiskopf.

Allen B. Laing Company, Plainfield, N. J.; capital, $20,000; incorporators, Allen B. Laing, Isabel M. Laing, George F. Graves, Augustus V. Searing, Eugene M. Laing.

F. B. Williams Company, Cincinnati, O.; capital, $10,000; incorporators, Fanny B. Williams, George C. Kuhn, Dwight F. Jerauld, Samuel Hummel, David S. Buchanan, Jr.

Jay A. Rickard Company, Schenectady, N. Y.; capital, $72,000; incorporators, J. A. Rickard, Jesse A. Rickard, B. C. Wheaton.

Louis L. Crane's Airship Transportation Company, Inc., Brooklyn, N. Y.; capital, $100,000; incorporators, Louis L. Crane, C. Crane, John F. Callaghan.

The Devney Automobile Machine Company, Glasgow, Ky.; capital, $50,000; incorporators, R. S. Devney, W. H. Jones, J. S. Cable, J. R. White.

The John Kohl Carriage & Automobile Company, Mason, O.; capital, $10,000.

Auto Supply Manufacturing Company, Chicago; capital, $50,000; incorporators, C. Youngberg, O. Albertson, A. W. Olsen.

The Stafford Illuminated Auto Lamp and Number Company, Dallas, Tex.; capital, $25,000; incorporators, M. M. Parks, F. W. Schaub, Felix Greenwood.

The Rockmore Motor Company, Brooklyn, N. Y.; capital, $5000; incorporators, George F. Morrison, Walter R. Herrick, Philip W. Carney.

The Expansion Spring Rim & Tire Company, Boston; capital, $500,000; incorporators, Charles O. Doyle, Harris L. McNeill, Orrie T. Bowman.

Pope-Hartford Company, Chicago; capital, $20,000; incorporators, James L. Russell, Jessie Shields, E. X. Jones.

The Safe Auto Tire Company, Martinsburg, W. Va.; capital, $125,000; incorporators, J. W. Scott, G. W. Buxton, E. S. Bottomly, W. C. Kilmer, S. W. Walker.

Starn Tire Manufacturing Company, Camden, N. J.; capital, $500,000; incorporators, G. E. Starn, G. M. Cline, W. C. Mayne.

Franklin Motor Car Company, New York City; capital, $10,000; incorporators, Glenn A. Tisdale, Albert F. Avid, 264 West 78th street; M. E. McDonald.

The Central Auto Supply Company, Des Moines, Ia.; capital, $10,000; president, A. W. Eggertsen; vice president, B. M. Starr; secretary and treasurer, A. J. Starr.

The Acme Auto Company, Cleveland, O.; capital, $10,000; incorporators, Willis C. Pollack, John D. Meyer, Mary E. Pollack, Susie K. Meyer, Elmer Edgerton.

Maxim Tri-Car Manufacturing Company, Morgantown, W. Va.; capital, $50,000; incorporators, Harry R. Warfield, Joe K. Buchanan, John L. D. Streator, H. B. Long, A. A. Hall.

Lexington Company of New England, Portland, Me.; capital, $10,000; president and treasurer, George E. Fogg.

Panwood Manufacturing Company, Grand Rapids, Mich.; capital, $60,000; incorporators, Fred Z. Pantlinf, Harold B. Woodcock, Robert G. Woodcock.

Keystone Garage Company, Chicago; capital, $2000; incorporators, Charles C. Loucke, Ephraim E. Atwood, Burell J. Cramer.

The Bernhard & Turner Automobile Company, Des Moines, Ia.; capital, $60,000; president and treasurer, J. C. Bernhard; vice president and secretary, Jay Turner.

Hudson Motor & Garage Company, Hoboken, N. J.; capital, $50,000; incorporators, Christian C. Moller, Robert W. Fulcher, Mathilde Moller.

The H. & S. Auto Company, Springfield, O.; capital, $10,000; incorporators, John W. Hennessey, John P. Sultzbaugh, M. Ruth Sultzbaugh, Anna M. Hennessey, James M. Collins.

Service Garage Company, Dunellen, N. J.; capital, $5000; incorporators, E. A. Craig, W. W. Stryker, Frederick Harrington.

Horst & Strieter Company, Rock Island, Ill.; capital, $10,000; incorporators, Henry W. Horst, Henry T. Horst, Martin E. Strieter.

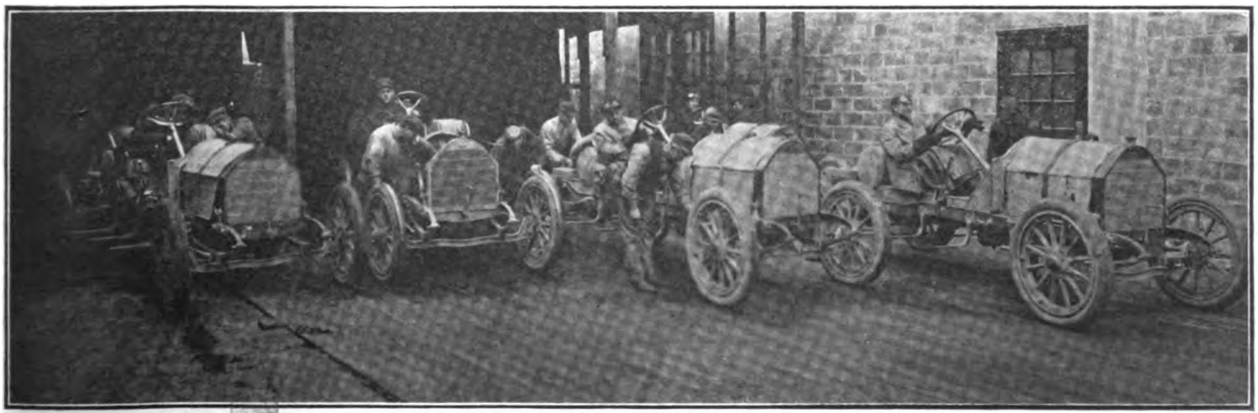
Henderson-Cole Motor Company, Dallas, Tex.; capital, $10,000; incorporators, W. F. Bridewell, C. F. Hurst, F. T. Bridewell.

Centaur Manufacturing Company, Inc., Buffalo, N. Y., capital, $35,000; incorporators, A. Schmidt, Bertha F. Schmidt, J. E. Barry.

Central Garage Company, New Canaan, Conn.; capital, $4000; president, Benjamin M. Mead; vice president, Harry C. Turner; treasurer, Harold H. Mead.

The Columbia Transportation Company, Camden, N. J.; capital, $50,000; incorporators, B. Johnson, C. U. Martin, J. A. MacPeak.

Webb-Veitch Company, Jersey City, N. J.; capital,



A Group of Testers about to Start from Factory of Cole Motor Car Company, Indianapolis, for a Day's Trip Over All Kinds of Roads and Hills.

$25,000; incorporators, C. N. King, Jr., G. H. Russell, E. H. Geran.

Bath Garage Company, Bath, Me.; capital, $10,000; incorporators, Charles W. Clifford, Charles W. Clifford, Jr., John E. Goff.

Nuse Wagon & Automobile Company, Newark, N. J.; capital, $50,000; incorporators, Fred Nuse, Fred Nuse, Jr., Louise Nuse, Maplewood.

O. A. R. Motor Company, Plainfield, N. J.; capital, $100,000; incorporators, A. A. Reed, E. J. Kuhne, E. A. Kuhne, H. G. Uhler, H. G. Uhler, Jr.

Anderson Brothers Auto Company, Oskaloosa, Ia.; capital, $5000; incorporators, Charles H. Anderson, F. M. Anderson.

C. L. Williams, Newark, N. J.; capital, $50,000; incorporators, C. L. Williams, A. C. Hunt, A. Hammond.

The American Hydro-Aeroplane Company, Camden, N. J.; capital, $100,000; incorporators, Edward R. Brown, Louis E. Corner, William B. MacDonald, all of Philadelphia.

Garage Realty Company of West Hoboken, West Hoboken, N. J.; capital, $10,000; incorporators, Louis Schmitt, Frank Eckert, Charles C. Clark.

Connecticut Commercial Car Company of Hartford, Hartford, Conn.; capital, $50,000; incorporators, Joseph J. Rapter; Gustave F. Kallberg, James B. Henry.

Rayfield Motor Company, Chrisman, Ill.; capital, $75,000; incorporators, F. K. Thayer, A. E. Schnitker, A. E. Steley.

The B. & B. Auto Company, Davenport, Ia.; capital, $10,000; president, Bert E. Brown; secretary-treasurer, H. S. Burnap.

R. H. Nesbitt Auto Company of Spartanburg, Columbia, S. C.; capital, $10,000; incorporators, R. H. Nesbitt of Spartanburg and W. D. Nesbitt of Birmingham, Ala.

Ft. Wayne Auburn Auto Company, Fort Wayne, Ind.; capital, $20,000; incorporators, J. M. Carmer, H. C. Hoodelmire, E. C. Walker.

Hudson Motor Car & Garage Company, Stafford, Conn.; increase of capital stock to $2500.

Excelsior Sales Company, Buffalo, N. Y.; capital, $10,000; incorporators, William F. Hanavan, Henry O. Wait, Leo F. Donnelly.

Hansen Automobile Company, Wilmington, Del.; capital, $50,000; incorporators, E. Moore, Jr., P. C. Hansen, F. H. Broman.

United Service Auto Company, Boston; capital, $10,000; incorporators, Rufus B. Skinner, Arthur L. Thomas, Lydia A. Brimmer.

Gray Auto Supply Company, Portland, Me.; capital, $10,000; incorporators, Walter J. Hardy, H. P. Sweetser, M. A. Thurston.

Atlantic Aviation Association, Boston; capital, $100,000; incorporators, Alonzo H. Merritt, James H. Scannell.

L. G. Fisk-Mooers Company, Boston; capital, $20,000; incorporators, Lessie G. Fisk, Edward P. Mooers, Fred Raymond.

Phillips Gasoline & Kerosene Engine Company, Chicago; capital, $6500; incorporators, Louis C. Kunert, Jr., Sidney Adler, Hyman L. Weiss.

Tri-City Auto Supply Company, Rock Island, Ill.; capital, $25,000; incorporators, O. P. Sala, Jr., Frank Sala, E. M. Sala.

Forest City Automobile Company, Forest City, Me.; capital, $25,000; incorporators, W. B. Clarke, J. A. York and others.

Auto Shop Company, Paterson, N. J.; capital, $50,000; incorporators, W. McKee, G. F. Wright, F. Beegs.

Los Angeles Automobile & Taxicab Company, Los Angeles, Cal.; capital, $75,000; incorporators, Belle F. Lewis, Harry Jones, Evelyn E. Jones, Charles M. Lewis, William H. Lewis.

Fleet of Mais and Premier Machines in Service with the Central Transfer & Storage Company, Indianapolis, and Utilised by the Newspapers in Replacing Horsedrawn Equipment.

The M. M. Automobile Automatic Safety Signal Company, New York City; capital, $50,000; incorporators, J. C. McGee, W. F. Rawlins, I. M. Black.

Whitmore Auto-Gear Composition Sales Company, Jersey City, N. J.; capital, $100,000; incorporators, B. S. Mantz, J. R. Turner, L. H. Gunther.

Independence Oil Delivery, Burlington, N. J.; capital, $100,000; incorporators, G. S. Neath, R. P. Moore, H. Eastwood.

Standard Automobile & Tire Company, Plainfield, N. J.; capital, $25,000; incorporators, H. P. Vosseller, J. J. Slevin, F. Ivamy.

Amalgamated Motors Corporation, Los Angeles, Cal.; capital, $1,000,000; incorporators, W. M. Varney, C. B. Croner, Robert McKee, Ernest Kouwen-Hoven, E. P. Craig, C. L. Woodbury, R. F. Davis, L. Scheer, C. J. Schroeder, J. A. Craig, T. W. Beddo, J. L. Kirkham, Thomas Carmody, Jr., J. B. Price, N. E. Masson.

National Motor Transportation Company, Washington, D. C.; capital, $1,000,000; incorporators, not given.

Excelsior Specialty Company, Jersey City, N. J.; capital, $30,000; incorporators, F. Thomassin, F. O. Lockwood, A. Higson, G. H. Martens. C. S. Goodfellow.

Empire Automobile Company, Indianapolis, Ind.; capital, $100,000; incorporators, C. E. Gibson, C. B. Sommers, D. Sommers.

Bussing Agency, Inc., New York City; capital, $50,000; incorporators, G. Ozanna, J. V. Knoth, R. Webber.

Cliffside Motor & Supply Company, Cliffside Park, N. J.; capital, $50,000; incorporators, A. E. Neumann, G. F. Walker, G. C. Bottorff.

High Point Motor Company, High Point, N. C.; capital, $50,000; incorporators, George Wilson, S. L. Davis, J. E. Kirkman, Raley Stone.

Eastern Sales Company, Belfast, Me.; capital, $10,000; president, E. F. Littlefield; treasurer, Howard Cheney; clerk, H. T. Field.

Colyear Motor Sales Company, Los Angeles, Cal.; capital, $50,000; incorporators, Curtis C. Colyear, Florence Colyear, Arthur T. Neeley.

The Judd Automobile Company, Cleveland, O.; capital, $20,000; incorporators, Harry E. Davis and others.

High Point Motor Company, Raleigh, N. C.; capital, $3000; incorporators, George Wilson, S. L. Davis, J. E. Kirkman, Raley Stone.

Hatfield Auto Truck Company, Elmira, N. Y.; capital, $1,500,000; incorporators, D. H. McConnell, A. D. Henderson, G. G. Brown.

The Cleveland Metal Products Company, Cleveland, O.; increase of capital stock from $200,000 to $1,000,000.

Clearfield Automobile Company, Clearfield, Ia.; capital, $5000; incorporators, J. V. Wright, A. B. Clewell, H. W. Young.

National Auto Spring Tire Company, New York City; capital, $200,000; incorporators, R. J. Lackner, A. H. Karr, F. A. McCloskey.

The Hudson Automobile Exchange, New York City; capital, $100,000; incorporators, Alexander Aragona, Abraham Shulman, William F. Burke.

Victor Buggy & Auto Top Company, St. Louis, Mo.; capital, $2000; incorporators, Oliver E. Carter, Roscoe Perdue, Frank Roband.

Requa European Motor Company, New York City; capital, $10,000; incorporators, Leonard F. Requa, Frederick Charavay, Edward S. Beach, 149 Broadway, New York City.

Amerital Manufacturing Company, New York City; incorporators, William O. Turrell, Salvatore Seognamillo, Lester W. Schwarz, 100 Morningside avenue, New York City.

The Prospect Stable & Garage Company, Brooklyn, N. Y.; capital, $10,000; incorporators, Dennis P. Healy, Dennis P. Healy, Jr., Mary Healy, 752 Sterling place, Brooklyn.

Standard Tire & Rubber Company, Springfield, Mass.; capital, $10,000; incorporators, William P. Cronin, James S. Waddell, Wayne S. Hughes.

Copithorn Demountable Rim Company, Natick, Mass.; capital, $100,000; incorporators, Walter E. Copithorn, Harry M. Ferguson, Louis C. Smith.

Ramsaur Bros. Company, Fayetteville, N. C.; capital, $25,000; incorporators, Hubert Ramsaur, Allen Ramsaur, Carl Ramsaur.

St. Louis Alco Automobile Company, St. Louis, Mo.; capital, $10,000; incorporators, Barton R. Ford, George Parsons, Charles E. Darrow.

Transportation Sales Company, Inc., New York City; capital, $550,000; incorporators, H. Walter Webb, James L. Breeze, Andre de Magnin, Broadway and 56th street, New York City.

The N. S. W. Motor Company, Indianapolis, Ind.; capital, $60,000; incorporators, Charles Nesom, Louis Sagalowsky, Frederick W. Wellman.

Available Truck Company, Chicago; capital, $500,000; incorporators, Edward F. King, Alfred H. Widhafft, Robert C. Blume.

Hydraerocraft Corporation, Chicago; capital, $500,000; incorporators, Horace P. Keane, Robert Middlekauf, Hugo S. Grosser.

The M. M. Automobile Automatic Safety Signal Company, New York City; capital, $50,000; incorporators, John C. McGee, Wilbur F. Rawlins, Ira Black, 419 10th street, Brooklyn, N. Y.

Englewood Motor Car Company, Chicago; capital, $1000; incorporators, C. A. Londelius, A. Eugene Jackson, John F. Wagner, 7253 Emerald avenue, Chicago.

Kaplan Auto Supply Company, Newark, N. J.; capital, $25,000; incorporators, Abraham Kaplan, T. A. Kaplan, Louis Unstatter, 40 New street, Newark.

Automobile Forgings Company, Detroit; capital, $100,000; incorporators, George W. Strelinger, David E. Van Derver.

Swastika Oil Company, Bay City, Tex.; capital, $5000; incorporators, G. C. Hamill, M. Thompson, A. M. Anderson.

Shirvin Auto Livery, Oklahoma City, Okla.; incorporators, H. M. Little, R. L. Backus, J. F. Pribyl, Clifton Johnson, P. E. Little.

Alhambra Garage Company, New York City; capital, $10,000; incorporators, Joseph C. Graveur, Martha Graveur, Gordon W. Kenney, 1921 Seventh avenue, New York City.

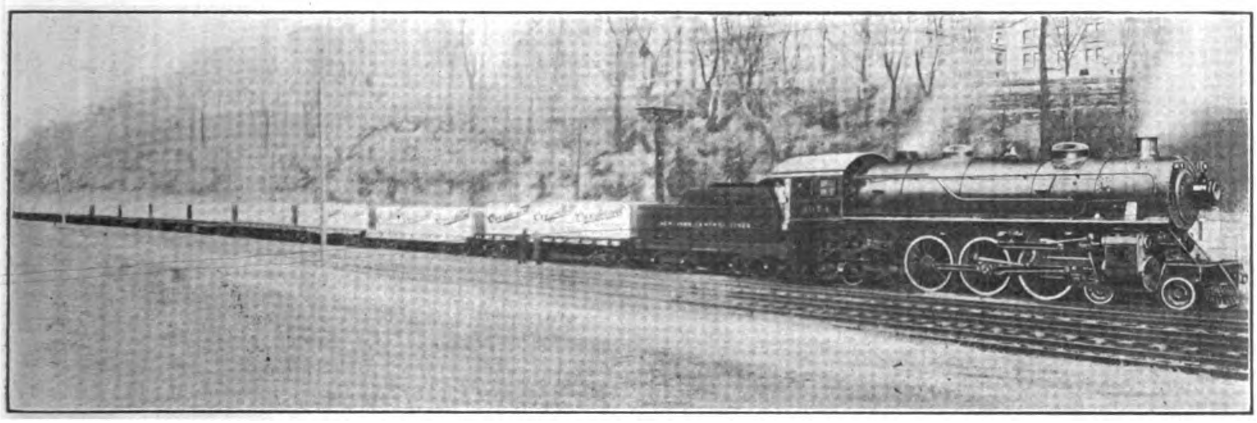
Standard Motor Car Company, New Bedford, Mass.; capital, $5000; president, T. F. O'Brien, Una Moriarty, Harry B. Wing.

Efficiency Supply Company, Boston; capital, $5000; president, William H. Murphy; treasurer, Francis J. Coughlin, 18 Boylston street, Boston.

Eastport Garage Company, Eastport, Me.; capital, $10,000; president, Fred P. Gilson; treasurer, Charles E. Martin; clerk, L. H. Newcomb.

The Motor Truck & Auto Company, Portland, Me.; capital, $10,000; president, Lewis A. Goudy; treasurer, George W. Merrow; clerk, Edward S. Anthoine.

Fishback Motor Company, New York City; capital, $3,000,000; incorporators, J. J. Wittenberg, Brooklyn, N. Y.; P. R. Galligan, J. W. Ebbs.



Special Train Load of Overland Cars Arriving at New York City from the Willys-Overland Company's Factory at Toledo, O.—The Machines Were Transferred to Steamers for Shipment Abroad.

GARAGE & DEALER

Newton D. Holbrook, president of the Litchfield County Automobile Association, and a director of the Connecticut state association, has resigned as sales manager of the Union Hardware Company of Waterbury, Conn., to become manager of the Ames Motor Company of Owensboro, Ky.

Albert G. Hamer, North Adams, Mass., has sold his business and equipment to the Tower Motor Company, 51 Main street, that city.

The Scott County Mercantile Company, Davenport, Ia., is occupying new quarters at Fourth and Riley streets, formerly occupied by the Buck Carriage & Implement Company. The concern is agent for the Maxwell and Columbia cars, made by constituents of the United States Motor Company, New York City.

The Leyman Motor Company, Louisville, Ky., has moved its salesrooms to Third and Breckenridge streets. The concern is local distributor of the Buick line.

Earle C. Anthony, owner and manager of the California Motor Company, Los Angeles, Cal., is erecting a reinforced concrete and steel structure, and plans a house warming upon the completion of the building, which will cost about $150,000.

The Cheeseman Automobile Company, Salt Lake City, Utah, which was organized recently to handle the Stoddard-Dayton, made by the Dayton Motor Car Company, Dayton, O., expects to occupy its new building at 45 South State street shortly. The concern will conduct a service station.

The A. Elliott Ramsey Company, Brooklyn, N. Y., is making extensive alterations to a three-story building on Putnam avenue, which will be utilized as a service building for Hudson cars, made by the Hudson Motor Car Company, Detroit, Mich.

W. H. Halliwell, president of the Halliwell Company, Los Angeles, Cal., announces that the concern will occupy new quarters in the near future.

The Southwest Auto Company, which maintains its business offices at El Paso, Tex., and which has a large number of agencies, will establish a branch agency in Phoenix, Ariz.

The Reo Pacific Company, San Francisco, Cal., distributor for the Reo and Premier lines, announces the completion of its new three-story building on Fulton street, near Van Ness avenue. The entire lower floor of the structure will be devoted to a spacious show room and offices of the president, Norman Devaux, and the sales manager, H. E. Gilley. In the rear of these rooms will be located the machine shop, access to which is by a small street.

Ketchum & Co., Ltd., Ottawa, Canada, is erecting a new garage on Sparks street, which when completed will be one of the most modern structures of its kind in Canada. The plans call for a 66-foot frontage, while the whole building will be 200 feet in length. Steel will be employed largely. The repair ship will be located on the second floor while the ground floor will be devoted to offices and supplies.

The Universal Auto Repair Company, High and Allyn streets, Hartford, Conn., is planning to enlarge the present quarters to take care of its increasing business. W. J. Langdon is manager of the accessory and supplies department.

The Corbin Motor Car Company, 1019 South Olive street, Los Angeles, Cal., is under new management, Frank L. Greene and W. B. Goode having purchased the Corbin agency and will represent the car made by the Corbin Motor Vehicle Corporation of New Britain, Conn.

The George Grede & Brothers Company, 240 Reed street, Milwaukee, Wis., has been appointed agent for the E-M-F and Flanders lines in Milwaukee and vicinity.

The Shafer Motor Car Company, Rochester, N. Y., has been formed and will handle the Cole line, made by the Cole Motor Car Company, Indianapolis, Ind.

The Scott County Mercantile Company, Davenport, Ia., has taken over the stock and business of the Buck Auto, Carriage & Implement Company. H. H. Derrough will continue to have charge of the motor car department of the concern.

C. B. Snyder is the manager of a new concern formed at Spokane, Wash., under the name of the Spokane Cole Motor Car Company, which company will handle the Cole line.

J. P. McCullom of Carthage, Ill., has purchased the Santa Fe Trail Garage at Dodge City, Kan. He will continue to handle the Cole product.

The Metropolitan Motor Car Company, Ltd., Vancouver, B. C., is the new name of the Pacific Garage & Auto Company. Mr. Boothby is the manager of the company.

The Butler Sales Company, Waterloo, Ia., has established headquarters on Park avenue and will handle the Colby cars, made by the Colby Motor Company, Mason City, Ia.

The E. E. Loving Auto Company, Memphis, Tenn., agent for the Cole line, has moved into new quarters at 289 Court avenue. The new building is two stories in height, of fire proof material and capable of housing 50 machines.

Harvey Parker, the well known tire man of Worcester, Mass., who recently secured the agency for the Palmer-Singer line, made by the Palmer & Singer Manufacturing Company, Long Island City, N. Y., is visiting the factory to acquire a mechanical knowledge of the car. He will return over the road with a demonstrator.

The Osen & Hunter Auto Company, San Jose, Cal., has changed its name to the Osen-McFarland Auto Company. The company which is located at First and James streets, has a branch at San Francisco. O. C. McFarland has succeeded to the interests of A. E. Hunter.

The United Motor Car Accessory Company, a concern organized recently at Sioux City, Ia., will occupy sales and store rooms at Sixth and Nebraska streets. Ernest Shultz will be manager.

The Cunningham Auto Company, Des Moines, Ia., has taken over the state agency for the Clark line, made by the Clark Motor Car Company, Shelbyville, Ind.

The Des Moines Garage Association, organized recently at Des Moines, Ia., elected the following officers at a recent meeting: President, J. C. Bernard; vice president, L. H. Tietge; secretary, V. G. Claiborne; treasurer, S. Johnson. The membership of the organization includes practically all of the automobile, garage and accessory men of the city. The purpose of the association is to establish uniform prices for labor, etc.

The Ford Motor Sales Company, Harrisburg, Penn., has leased the building at 906 Market street, formerly occupied by the Capital City Garage and will remodel the structure.

The Riddell Auto Company, Des Moines, Ia., distributor in central Iowa for the Overland line, has added C. B. Peironnet and R. P. Walston to the selling staff.

The Roberts Garage, Pleasant street, Northampton, Mass., has taken the agency for the line manufactured by the United States Motor Company, New York City, which includes the Brush, Maxwell, Stoddard-Dayton and Columbia, and Sampson trucks.

George T. Butterfield of Medford, Mass., and F. H. Jordan of Boston, have purchased the building and business of the Tudor Garage Company, Chelsea, Mass. The new owners are experienced automobile men. The top floor of the building will be utilized for the manufacture of the Jordan demountable rim.

Abbott-Detroit
A
Abbott-Detroit
Cars

Sales Branch of the Abbott Motor Company, on East Jefferson Avenue, a Prominent Location in Detroit.

The Carhart Motor Company, Oklahoma City, Okla., has established two new branches, one at Guthrie and and another at Muskogee. Blake & Varley will have charge of the former and H. A. Benefiel of that at Muskogee. The company represents the Overland line, made by the Willys-Overland Company, Toledo, O.

Leonard Zengel, the well known racing driver, has associated himself with Thomas A. Phillips in the Phillips Motor Car Company, 324 West Third street, Dayton, O. The company plans the erection of a fine concrete garage, and will handle the Stutz, De Tamble and Fiat.

A. W. Trevor and W. E. Snider of Rock Island, Ill., have formed a partnership to handle the Stearns-Knight machine.

Russell P. Taber, Hartford, Conn., for several years agent for the Reo line, made by the Reo Motor Car Company, Lansing, Mich., has opened an agency at Waterbury, Conn., which will be in charge of Carl Humphrey and Samuel W. Taber. A garage and repair shop will also be maintained.

J. W. Naughton, Ware, Mass., has completed a structure on Pleasant street and will conduct a repairing business.

The Kentucky Motor Car Company, Cincinnati, O., of which Paul Hesser is at the head, expects to occupy new quarters at Park place and Scott street where a fire proof garage is being erected.

Brown, Thomson & Co., Hartford, Conn., has taken the agency for two lines of electrics in addition to gasoline automobiles. These are the Rauch & Lang and Standard.

The Buffalo Automobile Trade Association, Buffalo, N. Y., has elected the following directors to serve for the ensuing year: Ralph E. Brown, John J. Gibson, Charles F. Monroe, George Ostendorf, William Densmore, Gustave Miller and E. C. Bull.

The Schacht Motor Sales Company is announced as successor to the Siegmund Motor Car Company at Los Angeles, Cal. The new concern will handle the Schacht line, made by the Schacht Motor Car Company, Cincinnati, O.

The Westcott Motor Car Company of Little Rock, Ark., has been organized and will locate on Main street. H. M. Westcott is president, Irving Hirsch vice president and secretary, and Henry Fletcher treasurer. The concern will handle the Westcott line, made by the Westcott Motor Car Company, Indianapolis, Ind.

The Morse-Readio Auto Company, Springfield, Mass., has secured a tract of land between Dwight and Chestnut streets and plans to erect a six-story structure of the latest fire proof design. The foundation will be reinforced concrete, the framework of steel, and floors and roof of fire proof material. The building will have a frontage of 78 feet and be 97 deep.

The Wade & Dunton Motor Car Company, Lewiston, Me., is occupying new quarters. The structure is 50 by 100 feet, four stories in height and of brick. The first floor will be utilized for automobiles, the second as a salesroom and the third for storage, and top floor as the repair shop.

Bishop & Whitney, which operates a garage at Cananseraga, N. Y., has acquired the garage conducted by Roberts & Son, Elmira, N. Y.

The Horst & Strieter Company, Davenport, Ia., is now occupying new quarters in the Horst building, 1417 Second avenue. The concern is headed by Henry W. Horst with Henry T. Horst, vice president, and M. E. Strieter, secretary and treasurer.

Fred E. Folger has purchased the garage department of the Warner Automobile Company, Watertown, N. Y., and will handle all kinds of supplies and conduct a general repair business. He was formerly sales agent for the Ford Motor Company, Detroit, in Alberta, Canada. Mr. Warner will retain the agency for the Ford line.

William Fairchild and Ralph McGraw, Newburgh, N. Y., have purchased the garage on Grant street conducted by Daniel Aber. An adjoining building has been secured and will be utilized as an office with a rear driveway connecting with the other structure.

The Atlanta Automobile Top & Trimming Company, Atlanta, Ga., of which George W. Anderson is president and owner, has secured the agency in Georgia for the Bergdoll, made by the Louis J. Bergdoll Motor Company, Philadelphia.

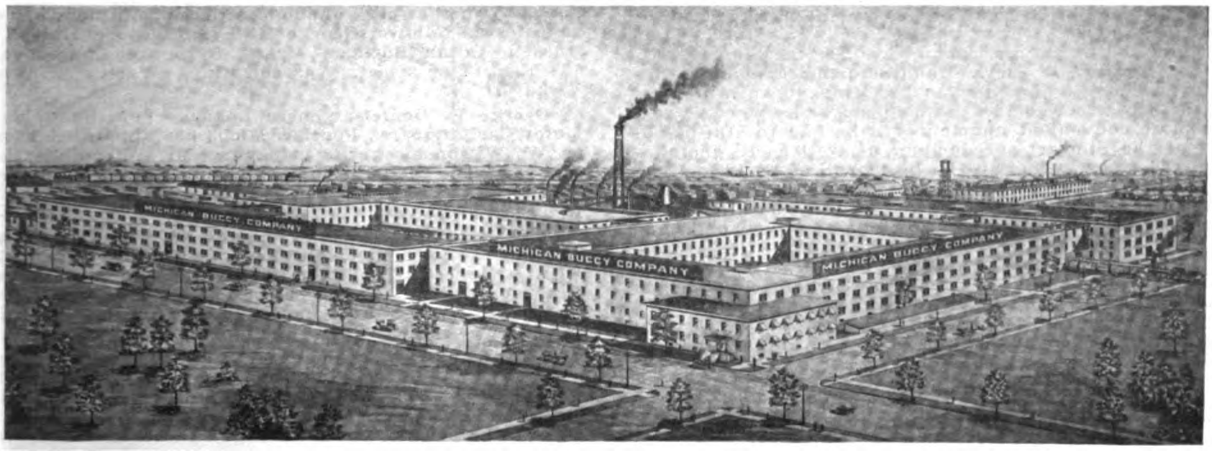
The A. C. Guy Company, Worcester, Mass., wholesaler of lubricants, has moved from 102 Commercial street to 120 Main street.

The Ohio Motor Sales Company, Des Moines, Ia., has contracted for the agency of the De Tamble line, manufactured by the De Tamble Motors Company, Anderson, Ind.

The J. W. Bowman Company, Boston, has added the Waverley electric, made by the Waverley Company, Indianapolis, Ind., to the line of pleasure and commercial vehicles carried by it.

A. F. Shallberg, Moline, Ia., has given up his agencies for the gasoline vehicle and will devote his attention in the future to promoting the sales of the Rauch & Lang electrics, made by the Rauch & Lang Carriage Company, Cleveland, O. He has disposed of his garage, but it is his intention to open a new one devoted to the interests of electric vehicles.

Edwin R. Stancliff, Elmira, N. Y., has been appointed general manager of the Auto Car Sales Company, Los Angeles, Cal., and will have full charge. He formerly was connected with the New York office of the company.



Factory of the Michigan Buggy Company, Maker of the Michigan Car, at Kalamazoo, Mich.

The Warren Garage, Worcester, Mass., is undergoing extensive alterations. A section near the entrance and adjoining the office is being converted into a show and salesroom.

The Steenrod Auto Supply Company, Wheeling, W. Va., expects to occupy its new four-story fire proof garage at 2106 Main street shortly. It will have a capacity of 200 machines. The first floor will be utilized for storing cars while the second will be employed as the repair shop. As business increases the remaining floors will be used.

The Blue Ribbon Garage, Inc., Meriden, Conn., which was organized about two years ago, by Bridgeport parties, has been sold to Mauritz Mathison, David E. Brown and Arthur Oldroyd. The new company will conduct an up-to-date service station and will make a specialty of repairing.

Harry E. Pence, president of the Pence Automobile Company, Minneapolis, Minn., has secured the Hennepin Avenue Methodist Church property and will convert it into an automobile plant having six stories of ample floor space.

J. G. Tennant & Co., 2247 Michigan avenue, Chicago, has taken the agency for the Simplex, made by the Simplex Automobile Company, New York City.

Thomas Bush, Elmira, N. Y., has joined the sales force of the Chemung Motor Company of that city.

L. B. Keeton, Elmira, N. Y., has entered the employ of A. M. Zimbrich as salesman of the various lines which the latter represents.

The Ford Sales Company, Utica, N. Y., has secured property on Pine and Lafayette streets and will tear down the present structure and erect a two-story brick building, which will be 48 by 87 feet. The lower floor will be devoted to a salesroom and garage and the upper utilized as a repair shop. The building will be constructed of fire proof material. Electrical appliances will be employed throughout.

Cecil C. Robinson has been appointed general manager of the Roberts Motor Company, Jacksonville, Fla. Bert Farnum will have charge of the repair shop.

The Osen & Hunter Auto Company, San Jose, Cal., is erecting a new building at the corner of McAllister and Polk streets. Some changes are announced in the firm, O. C. McFarland, the San Francisco manager of the concorn having purchased the interests of A. E. Hunter and the company's name hereafter will appear as the Osen-McFarland Auto Company. Mr. Hunter will continue in the present quarters as agent for the Garford and Firestone-Columbus.

William Klockau, Rock Island, Ill., is planning to erect a three-story brick garage at Fourth avenue and 16th street.

The G. W. Blake Auto Company, Inc., Colorado Springs, Col., will erect a new garage and salesroom on North Nevada avenue. The new structure will be of fire proof material and equipped with modern conveniences for the repair and maintenance of automobiles.

Milton Coombs, formerly engaged in the real estate business at Warren, O., has opened a garage on West Front street, Youngstown, which will be known as the Buick Sales Company.

The Astoria Garage Company at Willow and Franklin streets, Long Island City, N. Y., has been opened by a company headed by F. A. Simmons. The building is of the latest fire proof design.

The Lexington Motor Car Company, Boston, which was organized recently to distribute Lexington cars, made by the Lexington Motor Car Company, Connersville, Ind., is now located in new salesrooms at Boylston and St. Cecilia streets.

The Herring Motor Car Company, Des Moines, which delivered 1146 Ford cars last year, is said to be one of the largest distributing houses in the country. The company announces that to date it is 267 ahead of the 1911 record.

The Abbott Motor Charlotte Company, Raleigh, N. C., announces a change in its name to that of the American Motor Car Company of which Julian L. Lummus is president and W. Ruffin Smith, secretary.

The Shawnee Motor Car Company, Topeka, Kan., which was incorporated recently, has taken over the business of the Shawnee Motor Company, a partnership consisting of Frank Holland and B. F. Taylor. The new company has leased a building at 928 Kansas avenue and will make extensive alterations.

Harvey Parker, Worcester, Mass., special agent for Batavia tires, announces that he has taken the agency for the Palmer-Singer line, made by the Palmer & Singer Manufacturing Company, Long Island City, N. Y.

S. G. Meredith, Richmond, Va., is building a garage on Monument avenue, between Sheppard and West streets.

The Broadway Motor Car Company has been formed at Columbus, O., to handle the Paige-Detroit in Franklin county and to do a general garage business. J. F. Morgan and H. F. Kaiser comprise the new concern.

Sperry & Hoover has taken over the repair business of the Adamson Automobile Company, at 35 West Mound street, Columbus, O. Mr. Adamson will continue to devote his attention to selling motor cars.

The Haus & Bitler Company, Wapakoneta, O., has taken the agency for Stoddard-Dayton cars.

The Albany Garage, Albany, N. Y., one of the largest and oldest in that state, will erect shortly a three-story building on Howard street to handle commercial vehicles. The concern has taken the agency for the White line, made by the White Company, Cleveland. Chauncey D. Hakes, who has had considerable experience in the automobile industry, is manager.

WITH THE MANUFACTURER

The Connecticut Shock Absorber Company, Meriden, Conn., announces the opening of an office, show and stock room at 231 West 54th street, New York City, where a complete line of Connecticut shock absorbers and fittings will be carried as well as installed.

The Velie Boston Branch of the Velie Motor Vehicle Company, Moline, Ill., announces the following appointments of agencies to handle Velie pleasure and commercial vehicles: J. T. Curtis & Co., Hartford, Conn.; C. H. Sawyer Company, Manchester, N. H.; Robert Kayser, Concord, N. H.; Walter Velie Johnson, Burlington, Vt.

"The Great Western Tattler," a publication devoted to the interests of the Great Western Automobile Company, Peru, Ind., contains several interesting as well as instructive articles pertinent to the motor car.

The Central Transfer & Storage Company, Indianapolis, Ind., maintains a fleet of automobiles and in the accompanying illustration is depicted four Mais trucks, made by the Mais Motor Truck Company, and six Premier delivery vehicles, manufactured by the Premier Motor Manufacturing Company of the same city. These machines are utilized by the newspapers of Indianapolis and one publication, the News, has 36 sub-stations which are supplied by 10 machines, these doing the work in about one-third the time formerly required by 18 horse drawn vehicles.

The Abbott Motor Company, Detroit, announces a sales agency at South Edmonton, Alberta. O. J. Edinger, an experienced automobilist, is the proprietor, and the agency will be known as the S'Cona garage.

Edward Wells of Boston has been re-engaged by the E. R. Thomas Motor Car Company of Buffalo, N. Y., as assistant sales manager of the factory.

A. C. Stebbins, secretary and general manager of the Lansing Company, Lansing, Mich., is making a trip through Guatemala and Panama.

The Stewart & Clark Manufacturing Company, Chicago, has moved its Minneapolis, Minn., branch from 45 South 10th street to 1202 Hennepin avenue, where larger and more convenient quarters will be had for the handling of the Stewart speedometer as well as its installation. The new office will be in charge of T. J. Snelling, who has been with the company for some time. A. H. Champlin, who has had charge of the office, will call upon the trade in Minnesota, outside of Minneapolis and St. Paul, and Iowa.

Charles F. Kellom & Co. the New England branch of which is located at 284 Columbus avenue, Boston, announces that the Darling Automobile Company of Portland and Auburn, Me., has secured the exclusive right for the sale of Invader oil in the entire State of Maine.

The Remy Electric Company, Anderson, Ind., maker of ignition specialties, has appointed the following concerns to act as Remy service stations in their respective cities: Child, Day & Churchill, Inc., Spokane, Wash.; Washington Auto Supply Company, Seattle, Wash.; Archer & Wiggins Company, Portland, Ore.; Ballou & Wright, 86 Sixth street, Portland, Ore.; Browne & Leacy, Savannah, Ga.; Joseph Woodwell Company, 201 Wood street, Pittsburg, Penn.

J. K. McKeough has accepted a position with the Chicago branch of the Velie Motor Vehicle Company, Moline, Ill. He will be connected with the commercial car department.

Edgar E. Muller has been appointed manager of the recently established service department of the Ohio Motor Car Company, Cincinnati, O.

The Abbott Motor Company, Detroit, announces that arrangements have been made whereby the White Automobile Company of Baltimore, Md., will have the exclusive sale of Abbott-Detroit cars for the States of Maryland and Virginia. Another contract is that with the Eastern Motor Company of Atlantic City, N. J.

The Stewart & Clark Manufacturing Company, Chicago, has leased the store and basement at 174 Columbus avenue, Boston.

Manager Westerdale of the Chicago branch of the R-C-H Corporation, Detroit, has appointed W. J. Williams manager of the local retail sales.

The Greenville Metal Products Company, Greenville, Penn., will engage in the manufacture of motor cars, having closed a contract, it is stated, for the delivery of 13,500 cars to a western concern. The officers of the Greenville concern consist of: President, S. H. Penfield; vice president, Fletcher Goodwill; secretary and treasurer, F. L. Fay.

The Omaha Motor Company, Omaha, Neb., which was incorporated recently, is to erect a factory on the site adjoining that of the Stroud Machine Works. The company is to build a five-passenger car of moderate price.

Hamilton Cowley, Elwood E. DeHart, Edward G. Richardson and Walcott V. Smith are recent additions to the sales force of the New York branch of the R-C-H Corporation of Detroit.

The Fishback Motor Company of Newark, N. J., is negotiating with the Bristol Business Men's Association of Bristol, R. I., relative to removing its plant to that town.

Lucius Wilson has resigned as secretary of the Chamber of Commerce, Detroit, to become associated with the Warren Motor Car Company of that city, maker of Warren cars, in the capacity of vice president and general manager.

The De Tamble Motors Company, Anderson, Ind., has been reorganized, and James W. Sansberry, president of the National Exchange Bank, has been appointed general manager. Charles H. Walters, who has been secretary and general manager, is to become general superintendent. The capital stock has been increased to $200,000.

The King Motor Car Company, Detroit, maker of the King car, is occupying its new plant formerly utilized by the Hupp Motor Car Company. The factory will provide a floor space of about 70,000 square feet, and comprises practically a group of four buildings.

The Steenrod Dual Ignition Spark Company has been organized and will locate in Wheeling, W. Va. The company will manufacture a dual ignition device which distributes two sparks to one cylinder at the same time by the use of a single distributor. The ignition system is the invention of George W. Steenrod. It is applicable to both new and old motors.

The Bridgeport Brass Company, Bridgeport, Conn., is issuing a neat postal folder calling attention to the Atlas pump and other products made by it.

The Remy Electric Company, Anderson, Ind., announces the establishment of a new service station with the Lamb Electric Company of Grand Rapids, Mich.

The Stewart & Clark Manufacturing Company, Chicago, well known maker of speedometers, completed recently a new building at a cost of $100,000 in which modern machinery has been installed to take care of the drop forging end of the business.

The Henderson Motor Sales Company, Indianapolis, Ind., distributor of the product of the Cole Motor Car Company of that city, announces the appointment of new agencies as follows: George Mills, Shreveport, La.; H. F. Russell, Ocean Springs, Mass.; Byron & Cunningham, 109 East Elm street, Waseco, Minn.; Warley & Terry, Viola, Ill.

George E. Daniels, general manager of the Oakland Motor Car Company, Pontiac, Mich., has appointed Thomas W. Wilson as works manager. Mr. Wilson has had an experience in the automobile industry extending over 15 years and was formerly general superintendent of the Fiat plant at Poughkeepsie, N. Y.

The Ohio Motor Car Company, Cincinnati, O., announces the opening of an agency at Toronto, Can., with Hess & Meyers. The latter has a sub-agency at Massey, Ont. A new garage and salesroom, 50 by 150 feet, will be erected at Toronto and will be located on Richmond street, the centre of the automobile district.

The Colt-Stratton Company, New York City, eastern distributor of the Cole Motor Car Company, Indianapolis, Ind., gave a banquet in the former city recently at which the eastern agents of the company were the guests. It was the second annual smoke talk and William L. Colt presided as host. Agents were present from Maine to Maryland, also G. E. Roberts of Aukland, New Zealand. The feature of the banquet was the presentation of a gold medal to Henry J. Habich of the Boston agency by President J. J. Cole of the company in recognition of the excellent work of the former with a stock car in racing events during the past season. President Cole spoke of the new factory being erected, and Treasurer Frank Morrison dwelt upon the racing situation. Charles P. and R. P. Henderson of the Henderson Motor Sales Company, Chief Engineer Charles Crawford, A. F. Knoblock and William L. Colt spoke upon subjects pertinent to the automobile industry.

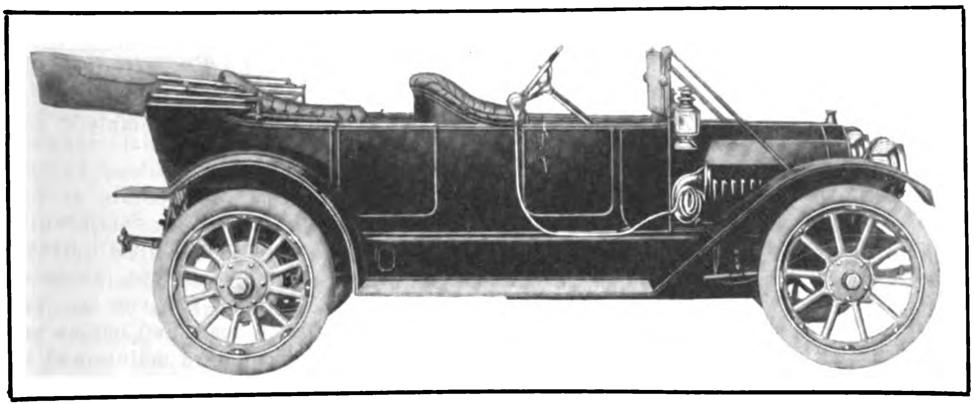
The OttoMobile Company, Philadelphia, which was organized recently to take over the manufacture of pleasure and commercial vehicles, formerly made by the Otto Gas Engine Works, Philadelphia, announces that a new factory will be built at Mt. Holly, N. J. The Delamater-Byrnes Automobile Company has been awarded the New York territory and quarters have been established at 10 West 60th street. L. F. Hewlett has taken the Brooklyn agency and is located at 1270 Bedford avenue.

The Shortsville Wheel Company, Shortsville, N. Y., maker of automobile wheels, is erecting an addition to its plant. The new structure will be of brick, 150 by 40 feet.

The Henderson Bulletin, issued by the Henderson Motor Sales Company, Indianapolis, Ind., contains in the current number a technical description of the Cole motor cars for which the company is distributor.

The Willys-Overland Company, Toledo, O., recently made a shipment of 99 Overland automobiles to New York City, whence they were consigned to foreign ports. A special train was made up consisting of 31 flat cars, each laden with three machines. In the accompanying illustration is depicted the train pulling into New York City, where the boxed vehicles were transferred to steamers.

ATTRACTIVE LINES FOR LIVE AGENTS.



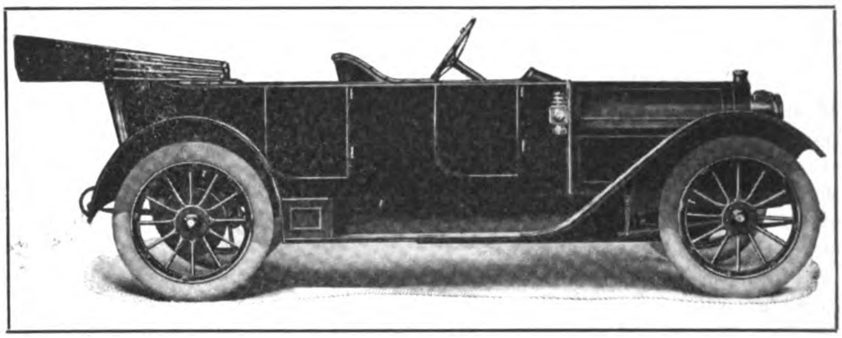
Marquette Model 25, Manufactured by The Marquette Company, Detroit Mich.—Price $3000.

Marquette.

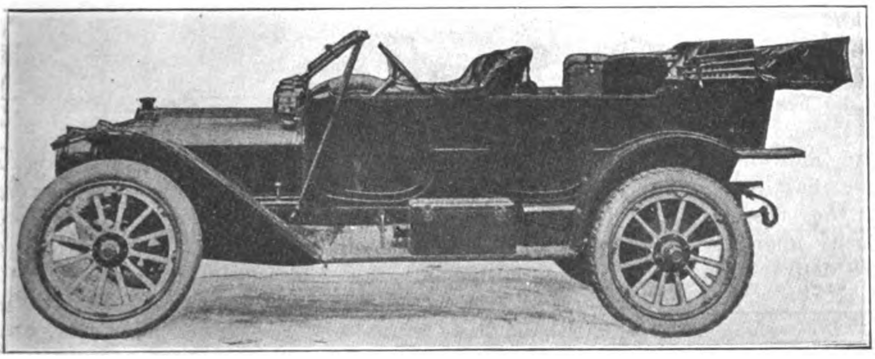
Motor—Four cylinders.
Bore—Five inches.
Stroke—Five inches
Horsepower—Forty.
Ignition—Dual.
Speeds — Three forward, reverse.
Clutch—Cone.
Drive—Shaft.
Springs—Semi-elliptic.
Tires—36x4.5.
Wheelbase—122 inches.
Body — Five-passenger touring.

Michigan.

Motor—Four cylinders.
Bore—4.25 inches.
Stroke—5.25 inches.
Horsepower—Forty.
Ignition—Dual.
Speeds—Three forward, reverse.
Clutch—Multiple disc.
Drive—Shaft.
Springs—Half and three-quarter elliptic.
Tires—34x4.
Wheelbase—116 inches.
Body—Five-passenger touring.



Michigan "40," Manufactured by the Michigan Buggy Company, Kalamazoo, Mich.—Price $1500.



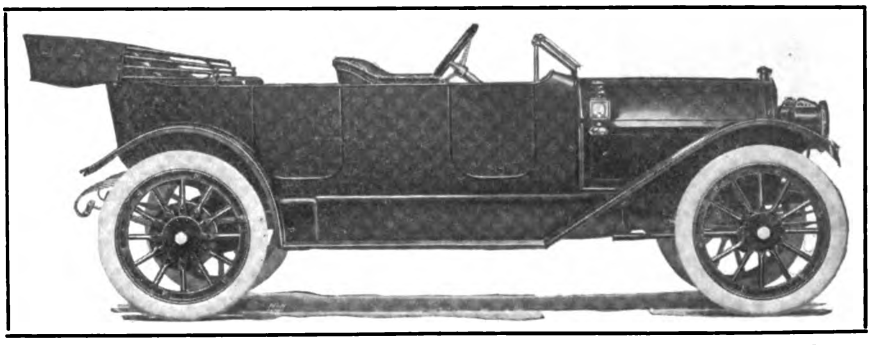
Berkshire, Four-Cylinder, 35-40 Horsepower, Manufactured by the Berkshire Motor Company, Cambridge, Mass.—Price $3000.

Berkshire.

Motor—Four cylinders.
Bore—4.69 inches.
Stroke—5.50 inches.
Horsepower—Thirty-nine.
Ignition—Dual.
Speeds—Three forward, reverse.
Clutch—Multiple disc.
Drive—Shaft.
Springs—Half and three-quarter elliptic.
Tires—36x4 front, 36x4.5 rear.
Wheelbase—124 inches.
Body—Five-passenger touring.

Imperial.

Motor—Four cylinders.
Bore—4.5 inches.
Stroke—5.25 inches.
Horsepower—32.4.
Ignition—Dual.
Speeds—Three forward, reverse.
Clutch—Cone.
Drive—Shaft.
Springs—Half and three-quarter elliptic.
Tires—36x4.
Wheelbase—120 inches.
Body—Five-passenger touring.



Imperial Model 44, Manufactured by the Imperial Automobile Company, Jackson, Mich—Price $1750.

STANDARD LINES OF RECOGNIZED LUBRICANTS.

Of prime importance in the proper functioning of the motor and other mechanical parts of the automobile is the matter of lubrication. Most manufacturers of oils and greases produce special preparations for the work they are intended to perform. This is a situation that had been developed with the motor car industry, until it is possible now to secure a grade of oil or grease designed especially for practically every make of car.

HAVOLINE
AUTOMOBILE CYLINDER
OIL
MEDIUM
HAVOLINE OIL COMPANY
NEW YORK CITY
HAVOLINE
COLONIAL
MOTOR
OIL
BORNE, SCRYMSER COMPANY
80 SOUTH ST. NEW YORK.
PHILADELPHIA. BOSTON.
FALL RIVER.

Lubricants: Havoline and Colonial.

Motorists cannot afford to experiment with lubricants of unknown or doubtful quality. The manufacturer of any product adopts a trade mark, or distinguishing feature, for the protection of the public. By continually making this feature prominent the user soon becomes familiar with the product and is intuitively warned against accepting substitutes under the plea that they are just as good.

Manufacturers of motor oils and greases have adopted distinguishing names and special cans whereby it is an easy matter for the motorist to recognize the article which he has found to be best suited to his needs. These names and cans, therefore, become the proper protection of the public, and their continued use insures to the purchaser that he will be able to rely upon the product which they represent.

Too much stress cannot be placed upon the admonition to see that the goods are delivered in the original package. Many makes are extensively exploited, and these have come to be recognized as standard productions. Herewith are presented a number of the better known oils and greases, the illustration of the cans being with the idea of causing them to be even more familiar. A brief description of the various products will suffice to indicate their particular features. The list is by no means complete, but includes those most extensively exploited.

PANHARD
CYLINDER
OIL
FOR AUTOMOBILES
AND MOTOR BOATS
MEDIUM
GEORGE A. HAWS
Lubricating Oils & Greases
New York, U.S.A.
MILLER'S
PAN-AMERICAN
LIGHT
MOTOR OIL
CHAS. E. MILLER
Home Office.
97 READE ST.
NEW YORK.

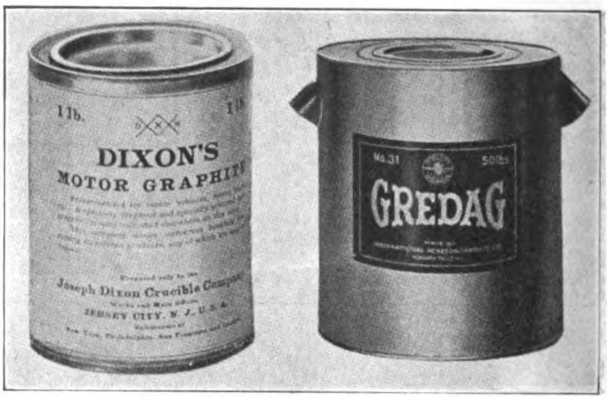
Lubricants: Panhard and Pan-American.

Colonial.

The Colonial brand, made by Borne, Scrymser & Co., New York, Philadelphia, Boston and Fall River, includes Colonial motor oil, Colo grease, Colonial timing gear oil and Silex grease. The concern has been producing lubricants for 30 years and has an enviable reputation for the high standard maintained by its products. Colonial oil is made in varying consistencies for the differing designs of motors, while Colo grease is particularly adapted for use in the transmission gears, being made especially for gear lubrication. Colonial timing gear oil also has a special purpose as indicated by its name. Silex grease is a product designed to lubricate and last, and at the same time to reduce noise in an appreciable degree.

Dixon's Graphite.

The line of graphite products made by the Joseph Dixon Crucible Company, Jersey City, N. J., is most complete. Inasmuch as the object of lubrication is that of providing a film sufficiently viscous to prevent the metal surfaces from coming in contact, it is held that flake graphite will attach itself directly to the metal, filling all the microscopic depressions and forming a smooth, tough, durable coating. For transmissions, flake graphite grease is recommended, and in this a proper amount of finely ground fibre is thoroughly mixed. Graphite cup greases are made in six degrees of hardness, varying from the consistency of vaseline to that of tallow.


1 lb.
1 lb.
DIXON'S
MOTOR GRAPHITE
Joseph Dixon Crucible Company
JERSEY CITY, N. J., U.S.A.
No. 31
50 lbs
GREDAG

Lubricants: Dixon's Graphite and Gredag.

Eagleine No-Karbon.

Eagleine No-Karbon oil is made by the Eagle Oil & Supply Company, Boston, Mass. It is held to possess the proper viscosity and to be pliable under all conditions of heat and cold, working well in the heat of the cylinder and feeding perfectly from an oil receptacle exposed to severe cold. Special attention has been paid to the matter of carbonization, and the addition of No-Karbon in the name of the product appears to be warranted by the success which has attended its use under most severe conditions. The line includes oils and greases for varying purposes, and Solarine polishes.

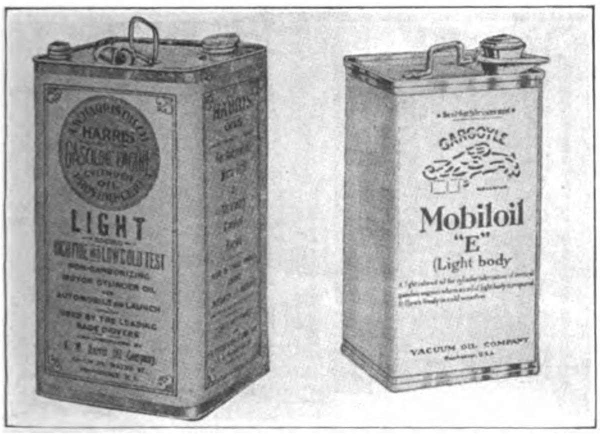
Harris.

Harris oils, the product of the A. W. Harris Oil

Company, Providence, R. I., are made in various degrees of consistency, each for the special purpose for which it is intended. The highest grade of Pennsylvania crude is utilized as a basis and the process of filtration is carefully watched and inspected. The ingredients which tend to form soot deposits are eliminated by a special process, and the result is such that the maker claims it is impossible to secure a higher degree of quality in this respect. Harris trans-compound is prepared for use with transmission gears and the same extreme care is taken in its production. A heavier bodied lubricant is provided in the gear and transmission oil made by this concern, which also specializes in a superheated steam cylinder oil for steam vehicles.

Havoline.

The Havoline Oil Company, New York City, absolutely controls its own oil fields, thus being supplied with a uniform quality of crude, which forms the basis for the well known Havoline oils. In its four refineries it maintains laboratories in charge of expert chemists who are constantly at work maintaining the standard set by this product. After the laboratory investigation and tests, which include a thoroughly scientific system of filtration for the removal of carbon producing elements, the oils are tested in engines on the block and on the road. Among the recent additions to the line is a special oil of heavier body and higher viscosity for motor truck use.



Lubricants: Harris and Vacuum Mobiloil.

Invader.

Chas. F. Kellom & Co., Philadelphia, has been producing Invader oils and greases for automobile work since the very inception of the industry, and of course, was interested in the manufacture of lubricants for many years previous to that time. About a year ago, it brought out the Invader gear oil, a special preparation for use in timing gears. This is a semi-fluid compound designed especially for the work it is to perform, and so successful has it been from the first that it has been adopted by numerous manufacturers for exclusive use in their machines. About the same time, a special motor truck oil was brought out as well.

Kincaid.

William T. Kincaid of the Kincaid Oil Company, Providence, R. I., is well known as a racing driver, although his attention has been turned toward the production and sale of lubricants in more recent years. His connection with the racing end of the industry placed him in close touch with the needs of automobile engines with respect to lubrication and this knowledge has been of material aid in the production of Kincaid oils. It does not follow, that Kincaid oils are designed especially for racing machines. The same qualities are needed for every day driving as in winning contests. These qualities, Mr. Kincaid has studied with the mind of an expert, and Kincaid oils are the result of this scientific and practical experience.

LUBROLEINE
LIGHT
MOTOR OIL
FISKE BROTHERS REFINING CO.
NEW YORK
POLARINE
Polarine
FOR MOTOR CAR AND MOTOR BOAT LUBRICATION
ZERO
STANDARD OIL COMPANY

Lubricants: Lubroleine and Polarine.

Lubroleine.

Lubroleine oils are made by the Fiske Bros. Refining Company, New York City, in three grades—heavy, medium and light. They are refined and made from the highest grade Pennsylvania crude, and are designed to meet the most exacting requirements of automobile, motorcycle, aeroplane and motor boat lubrication. The line also includes Lubroleine gearcase compound, a highly viscous grease of proper proportions; Phoenixo gearcase lubricant, in fluid, semi-fluid and heavy densities; and Slimax-Synovia, a solidified oil or cup grease. Special features claimed for all these products include their purity and uniformity, as well as their adaptability under any working and atmospheric condition.

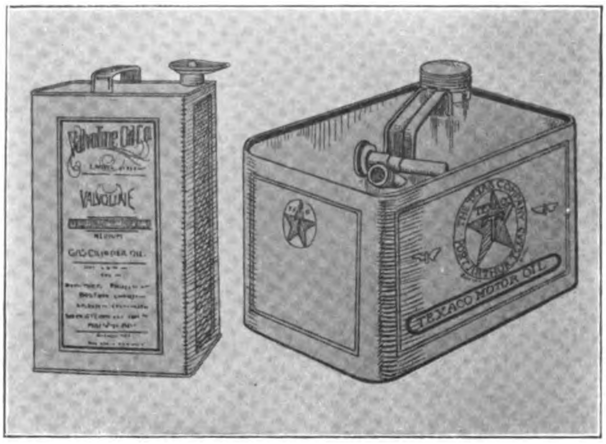
Mobiloil.

The Vacuum Oil Company, Rochester, N. Y., produces the Mobiloil line. Of the Mobiloils it may be stated that grade E is a light colored oil for cylinder lubrication. A is of medium body and is intended to hold its body under extreme heat. It may be used in electric vehicle lubrication as well as in gasoline engines. C is a heavy dark oil for transmissions and differential gears, especially for ball or roller bearing types. D is a heavy oil for steam cars. Arctic is a light colored oil which flows freely in the coldest

THE OIL YOU WILL EVENTUALLY USE
Kincaid Oil
INVADER GEAR OIL
FOR PACKARD TIMING GEARS
INVADER GEAR OIL

Lubricants: Kincaid and Invader.

weather. Vacuum transmission greases, made by the same concern, are in three densities. Vacuum Mobilubricant is a newer product, especially adapted for use in compression cups and for packing steering gears. All are of the best quality and have enjoyed a world-wide reputation for efficiency under all conditions of service.



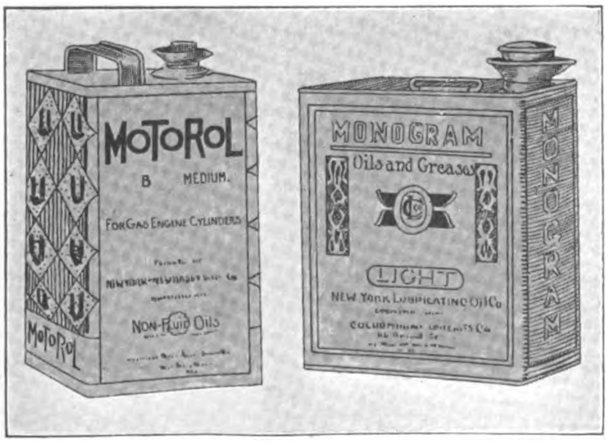
Lubricants: Valvoline and Texaco.

Monogram.

The New York Lubricating Company, now consolidated with the Columbia Lubricants Company of New York, has changed the style of its cans materially, the principal object being to insure that the purchaser shall receive Monogram oil just as it leaves the refinery. The cans are filled at the plant, and the sealed pouring spout is attached afterward. Monogram oil, therefore, comes to the user thoroughly sealed, and he must break the seal before it is possible to utilize the contents of the can. The maker has studied carefully the requirements of various cars and the lubricants are made in four grades, light, medium, heavy and V, for different makes of machines. Special attention is paid to the matter of eliminating all carbon producing impurities, and the success which has attended the use of Monogram oils in contest and road work is well known.

Motorol.

Motorol is made by the New York & New Jersey Lubricant Company, New York City, in varying densities to meet the requirements of a large number of cars. This is a cylinder oil designed to possess the most lubricating body with the least carbon. The same concern manufactures Non-Fluid oil for bearings, transmissions and differentials, this being a pure mineral oil lubricant which is claimed to possess decided advantages over greases and compounds. This latter oil is marketed in a patented can, styled Kejex, with a long grease gun spout and a key in the bottom to force the lubricant through this into the various grease cups, etc.



Lubricants: Motorol and Monogram.

Oildag.

The International Acheson Graphite Company, Niagara Falls, N. Y., is producing a line of graphite products in which the term Dag is used. The word "Dag" is made up of the initial letters of "Deflocculated Acheson Graphite." Therefore, Oildag is deflocculated Acheson graphite in oil, while Gredag is the same substance in grease. Mineral oil is utilized in Oildag, and it is claimed that this mixture will not deteriorate under any change in conditions of use. Gredag is made in four grades, semi-fluid, soft, medium and hard.

Pan-American.

Miller's Pan-American oils are made by Chas. E. Miller, 97-103 Reade street, New York City. They are refined from the highest grade Pennsylvania crude; are pure, distilled, highly filtered mineral oils, possessing a high fire test, low cold test, and are claimed to be unaffected by climatic changes. Three grades are provided for varying requirements. Under the same name is produced Miller's Pan-American transmission gear lubricant, also with low cold test and high melting points. This is made in three densities, light, medium and heavy, for transmission, sliding and planetary gears, respectively, the latter also being intended for cardan joints, ball and roller bearings, etc.

EAGLEINE
Auto Oils
NO-KARBON
THE OIL THAT SUITS AND DOES NOT SOOT
WOLF'S HEAD OIL
MOTOR CYLINDER
MEDIUM
OIL
WOLVERINE LUBRICANTS COMPANY
WOLF'S HEAD

Lubricants: Eagleine No-Karbon and Wolf's Head.

Texaco.

Another oil which is guaranteed not to congeal at any temperature down to zero is the Texaco, produced by the Texas Oil Company, New York City, which has large oil fields in many sections of the country. Special filtration methods are employed for the purpose of entirely eliminating the carbon depositing features, thereby insuring that it will burn up cleanly after performing its legitimate function. The various grades are of uniform quality throughout and each is prepared with a view to performing its work perfectly under all conditions of service.

Panhard.

Panhard oil, made by George A. Haws, New York City, is refined exclusively from Pennsylvania crude and is held to be absolutely uniform in quality at all times. Six grades are provided, light, medium, heavy, extra heavy, special motorcycle and marine motor. They have been in the market since the automobile industry was in its infancy, and have been tested thoroughly in all classes of work. Other members of the line are the following: Panhard heavy gear oil for transmissions and differentials; gear compound, of similar design but of stiffer consistency; anti-fluid transmission greases, in three grades; cup grease, graphite lubricant and cork graphite compound.

Polarine.

It is not surprising that the Standard Oil Company, New York City, should have entered into the matter of producing automobile oils. With its vast resources in the production of crude oil, and its experience in handling oils of all character, it possesses an experience which should be of service in solving the problem of proper motor car lubrication. Polarine oil embodies all the resources and experience of this concern. As its name implies, it has a low cold test, flowing freely at temperatures down to zero. Special processes of distillation, pressing and reducing enter into its manufacture. Other members of the line are Polarine transmission lubricants, Polarine fibre grease and Polarine cup grease.

Wolf's Head.

The Wolverine Lubricants Company, New York City, produces Wolf's Head oils, these comprising a full line of cylinder and other lubricants, each prepared with special care and for a particular purpose. The basis is the best crude, and the process of refining is in charge of experts who have made a study of automobile lubrication since the very inception of the industry. The result is a cylinder oil in which the carbon producing feature has been eliminated and which will burn up cleanly under exacting conditions. Before being placed upon the market, the product is subjected to severe tests to determine that it measures fully up to the standard set by the concern.

Valvoline.

The Valvoline Oil Company, Boston, Mass., owns and operates three large refineries, in which Valvoline oils are produced from the best Pennsylvania crude. This crude is piped directly to the refineries through the company's own pipe lines, and it is claimed that the Valvoline Oil Company thus controls the product from the oil well to the consumer. The refining process is designed to eliminate the possibility of carbon deposits, and the product is not adulterated in any manner whatsoever. The cylinder oil is made in four grades, white, light, medium and heavy. In addition the line includes a solidified mineral oil for gears and differentials and a mineral grease for bearings.

ANNEALING STEEL.

Annealing or softening of steel is accomplished by heating the metal to a red heat and then cooling it very slowly to prevent it from getting hard again. The higher the degree of heat, the more it will be softened, until the limit is reached when the steel melts. It does not follow, however, that the higher the temperature the softer the metal will be when cooled, no matter how slowly, and this is proved by the fact that an ingot is always harder than a rolled or hammered bar made from it.

Nothing is gained by heating a piece of steel hotter than a good, bright cherry red. On the contrary, a higher heat has several disadvantages: First, if carried too far the steel actually will be harder than a good red heat would leave it. Second, if a scale is raised on the metal, this will be harsh, granular oxide of iron, and will spoil the tools employed in cutting. Third, a high scaling heat continued for a little time changes the structure of the metal, makes it brittle, liable to crack in hardening, and impossible to refine.

To anneal any piece of steel, heat to a red, uniformily throughout, taking care not to let the ends and corners get too hot. As soon as heated, take it out of the fire, the sooner the better, and cool as slowly as possible. A good rule for heating is at so low a red heat that when the piece is cold it will show the blue gloss of the oxide that was put there by the hammer or the rolls. Steel annealed in this way will cut very soft, harden very hard and without cracking, and when tempered will be very strong and will hold a keen, strong edge.

ANNOYING RATTLES.

Sometimes annoying noises which seem quite unaccountable proceed from the footboards of the driving seat. There is an occasional bang and then again there is a continual rattle which leads one to surmise that the boards are loose. As a rule this is due to the levers of the pedals. Where these pass through the holes cut in the floor, it may be that the clearance, particularly at the back, is very small, and if the lever be very loose upon its bearing it will rock to and fro, producing a chattering which is hard to locate, as it ceases when the car is stopped.

CLEANING CHAINS.

Although the chain driven vehicle is in the minority there are many of this type in use, some of which are utilized for business purposes. When properly cared for chains give good service, but on the other hand if neglected, considerable wear takes place and new members as well as sprockets will be required.

Chains should be well lubricated in the bearing surfaces and to accomplish this it is necessary to remove all dirt and foreign elements. An excellent method is to place them in a large receptacle filled with gasoline and wash them thoroughly. Then, melt mutton or beef tallow in another large vessel, and add a small quantity of fine graphite. Place the chains in this and bring to a boil over a slow fire. The hot material will penetrate to every crevice, lubricating each working part. The members are then hung up to allow the tallow to harden.

UTILIZED WATER IN LAMPS.

The motorist who is not lacking in inventive genius usually overcomes many seemingly difficult problems. One who was returning from the country early in the evening found his oil lights going out one by one, and at a time when without carbide for the generator. There was still some oil in the lamps but the wicks were short and did not reach the fluid. Drawing some water from the radiator he poured this into the kerosene raising the level sufficiently to permit relighting and resumed the journey.

RIVETING KINKS.

Rivets are commonly used in relining brakes, clutches, etc., and the novice is apt to choose a heavy hammer for peining over the head, wondering why he is not successful. The proper tool is a light hammer with which a number of light blows are struck, spreading out the end as desired. If a rivet were held rigidly in a tight hole a heavy blow would expand only the projecting end, but they are not usually so held, and the tendency of the heavy blows is to displace and force apart that which it is desired to bring together firmly.

YOUR EXPERIENCE WITH YOUR BUSINESS.

How Should Garage Charges Be Established?

A custom inaugurated with animal use and adopted by automobile public service stations in the absence of precedent or knowledge has established a monthly charge for care and protection, the price being minimum for simple storage and maximum for constant attention. There is no deviation (with rare exceptions) from the "dead" classification price, but with the "live" storage may be washing and polishing every day if used, or but an occasional cleaning. There is a very wide variance to the service that is given for "live" price. For the owner whose car is used occasionally the cost is decidedly more than for the man who uses his machine every day.

In any garage constant shelter and protection is worth a certain amount, and where practically there is no attention unless specially ordered the only foundation for a charge would be proportion of floor area occupied. Where the machine is washed, polished, dusted, and otherwise cared for daily it will be seen that an hour each day for this work would mean 30 hours a month, or practically three days' labor, that ought to be paid for by the man whose car is worked on. Allowing an average price paid for labor of 20 cents an hour, which is low rather than high, and a charge at 30 cents, a reasonable ratio, this shows that work that cost $6 has been sold for $9, indicating a profit of $3, less the cost of the water, polish, soap, waste, and other supplies used. There is the price paid for storage to be added to the bill.

With the machine that may be used half as many times as that which has been illustrated the profit on labor is $6 instead of $3 and there has been but half the value of supplies used, this being another considerable item. Taking these two to demonstrate the statement it will be found that with some the service is comparatively cheap, and with others it is relatively expensive.

Many cars are kept in private garages, convenience, economy and failure to secure the degree of satisfaction desired being some of the reasons. It is a good business proposition to make the garage attractive to the motorist, and when the charge for service is the fundamental it would appear that the problem is to more nearly equalize the expense rather than making blanket prices.

The opinions of garage managers and owners are especially desirable to logically consider this condition. It is a fair assumption that what we have can be improved upon and with a view to obtaining expressions from those who are active and interested, and whose knowledge is entirely practical, the editor invites written articles not exceeding 600 words dealing with the differing phases of the subject. These should be submitted within 30 days to "Garage Service Charges," the ACCESSORY and GARAGE JOURNAL. For the three most meritorious, prices of $5, $3 and $2, respectively, will be paid. The announcement of the names of those whose articles have been approved will be made in the May issue.

Source and Cost of Platinum—At present the price of platinum, such as used for spark plugs and other electric contact points, is $42 an ounce for hard and $41 for soft metal. This is the highest price it has ever reached. In 1905, the pure material was quoted at but $8.50 without much demand. The enormous increase in number of automobiles and use elsewhere, together with the failure to discover new fields, has combined to raise the price steadily. In fact, the present tendency is even higher. The chief source of supply is a mine or group of them in the Ural mountains,

Has the Automobile Machine Shop a Future?

When conducted in connection with the automobile garage the repair shop may be a department with fine equipment or have but indifferent facilities for meeting with the requirements of the work. There may be widely different conditions in the same community, for obviously much depends upon the management and the methods the vogue, yet there are well defined business principles that cannot be discarded, although they may be modified with reference to each particular instance.

The agent may be desirous of giving a certain service to his patrons, and he may install such machinery and tools as will make it possible for him to take up practically all work that may be necessary in ordinary repairs and restoration, but there are special works which must be sent to specialists, and which cannot be otherwise obtained. It should be understood that many changes are made in machines which require fittings and parts not stocked and perhaps in every way different than standard. The average garage may not be able to furnish these. While this is not the only reason for a machine shop devoted exclusively to automobile work it is one of the dependable sources of income to be relied upon.

There is much dependent upon the class of mechanics employed. Shops that do commercial work of all classes have not equipment suited for motor vehicle work and the workmen lack experience. All other conditions being equal the special work is to be preferred. This opens the way for the concern that can serve all or a number of the garages, insure a uniform class of work and material, and at prices which are moderate. The shop of this type lessens the need of garage equipment and the initial expense and consequent maintenance cost. It is possible for the automobile machine shop to do general work to whatever extent may be desirable, but it is always available and can, if occasion requires, turn out a rush order with celerity.

In the machine shop that is maintained poorly the tools may be indifferent and in broken sizes, stock may be poor or insufficient, and the character of the workmanship may be at least open to criticism. With the specialized shop the conditions are exactly reversed. The possibilities for concentrating the motor vehicle work of a community seemingly increase with the increase of the population to be served.

The subject seemingly has such merit as to justify careful consideration of the proposal, with regard naturally, to local conditions. The views of those experienced in the character of service suggested are so desirable that the editor of the ACCESSORY and GARAGE JOURNAL invites all readers to express themselves in articles of approximately 600 words, stating opinions as are warranted by knowledge. The character of the article may be specific or general. For the article having the most merit $5 will be paid, and $3 and $2 will be paid respectively for the second and third in order of merit. It is desirable that these be submitted within 30 days. The May issue will announce the names of those whose articles have been given preference.

Cleaning Brass Castings—To pickle brass castings, take three parts sulphuric acid, two parts nitric acid. Mix and add to this mixture one pint of common salt and stir until it dissolves. Use an earthen vessel and then dip the articles deep. Remove at once and rinse in clear water. This will clean and brighten the castings.

Should Car Commissions Be Uniform?

The conditions under which agencies have been established throughout the country differ materially. Many manufacturers assume they have unusually attractive propositions and allow small commissions, pleading the low prices and the high cost of manufacturing. Others establish a scale from a minimum to a maximum commission, assuming that the agent's commission will be increased proportionately to his endeavors. Another class has a general selling agent or several selling agents who establish agencies and when the original commission allowed by the manufacturer is divided between the selling agent and the agents the man who really sells the cars gets less than he would had he a direct agency. Several manufacturers give bonus on volume of business, this being a percentage proportionate to the total transactions consummated. The general disposition, however, is to give to the agents a stated commission and the agents in turn bear all the expense of marketing the cars delivered to them.

The selling cost differs materially. If the agent has a single car with which to demonstrate and makes headquarters at a garage he has much less chance for selling, but his expense is small. If he has salesrooms, salesmen, advertises more or less, has an office force and maintains a repair shop or a garage, his expenses accumulate rapidly. There are conditions between these two which may be found in practically every locality and where business differs materially.

The question presented when viewed from a purely commercial standpoint is what will be best for the development of the industry. Again much depends upon whether the agent sells pleasure or industrial machines, or both. Obviously the small commission will not always attract the man who is capable of doing a large business. Some hold that it requires as much salesmanship to sell the small car as the large. The scale commission is not attractive to the man entering into business, because he requires all the encouragement he can have financially. Where the sales agent and the agent divide the commission there may be a lessened return as compared with other propositions of about the same character. On general principle a bonus is a reward for endeavor and cannot be regarded as certain income.

The subject of selling is one in which every manufacturer and sales agent, as well as every agent, has decided interest. It is not to be assumed that there is protest made against any person or methods, but of all the plans that have been adopted there appears to be good reason to believe that so long as the cars are sold as they are there will be endeavor on the part of men who are qualified to serve as agents to select what will afford them the most certain and the largest return. This being so with a uniformity of method and proportionate revenue there would be greater prospect of constant and continuous representation, a condition greatly to be desired.

For the purpose of obtaining opinions as to what method has the most attractiveness and merit from the viewpoint of the agent, the editor of the ACCESSORY and GARAGE JOURNAL invites written articles from its readers expressing opinions based on experience. These should be of approximately 600 words and should be submitted in 30 days. For the three most meritorious, $5, $3 and $2 will be paid. The May issue will publish the names of those whose articles have been selected.

Heat Resisting Packing—To make durable and permanent joints between rough cast iron surfaces, mix asbestos and a small quantity of white lead sufficient to make a very stiff putty. This will resist any degree of heat and is not affected by steam or water.

What Class of Storage Custom Is Best Paying?

With the operation of an automobile for pleasure the expense is often found to be such that economy is naturally regarded by the owner, and one of the fixed charges is for storage in the event the machine is kept in a public station. The storage is usually divided into two classes; live, which is usually accepted to include cleaning (washing and polishing) after use, or dead, in which no attention is given aside from shelter and protection. The charges vary because of differing reasons and the character of service. With the live cars there is a certain income assured the garage, while with the "dead" machines, though there is a minimum charge there is additional revenue because of extra work.

With exclusive dead storage, however, it is not necessary that the garage management furnish attendance other than to insure against theft and the like. With live storage washing and polishing means work that must be done regularly as often as desired, a rather uncertain demand in one sense, and constant attention. Some cars are used at all times and others are used but little during certain periods of the year, which increases the uncertainty.

It is the general experience that the proportions of the two classes differ materially during the year and that with many owners the service varies from the one to the other to best meet convenience. Because of the varying return from cars which are either "live" or "dead" at pleasure and the fixed charges of the garage, the income of the station is less per car than may be estimated by average, and this cannot be provided for unless the charges are made entirely on the basis of storage alone and other charges for cleaning according to the work performed, or the prices uniformly increased.

There are many garage managers who find that there is little, if any, profit in dead storage, but who are forced to accept such business with the expectancy that the customers may eventually become identified with the other class. There have been many experiences and convictions formed as to the productiveness of the two classes with reference to garage facilities and garage income, and it is for the purpose of obtaining such opinions that the editor of the ACCESSORY and GARAGE JOURNAL invites the readers to submit articles dealing with the subject. These should not be more than 600 words in length and may deal with any aspect that may be desired. These expressions should be submitted to the attention of "Storage," the ACCESSORY and GARAGE JOURNAL, and all articles must be received within 30 days. For the most meritorious review of the subject the price of $5 will be paid, and prices of $3 and $2, respectively for the second and third best considerations. Announcement of the names of the authors whose articles have been selected will be made in the May issue of the magazine.

GAS TANK PRESSURE.

Many motorists complain of the low pressure registered by the gauge on their gas tanks during cold weather and the following explanation is given by the Prest-O-Lite Company: "The correct pressure should be 225 pounds, or 15 atmospheres at 65 degrees Fahrenheit. When the tank is chilled this drops rapidly. A decrease of 49 degrees temperature causes the pressure to drop one-half. Nine to 10 atmospheres or 135 to 150 pounds pressure in cold weather is not unreasonable. To prove this, place the device in a room of normal temperature for one day and note the result."

WHO'S WHO IN THE INDUSTRY.

EDWARDS IS MARQUETTE MANAGER.

Clifton C. Edwards, Manager Marquette Boston Branch.

Clifton C. Edwards, well known to motorists throughout New England, has been appointed manager of the Boston branch of the Marquette Company, maker of Marquette cars, at 733 Boylston street. He assumed his new duties immediately preceding the Boston show, and was busy throughout that exhibition receiving the congratulations of his many friends who visited the Marquette display.

Mr. Edwards has been connected with the automobile industry for a number of years. For the past two years he has been connected with the E. R. Thomas Motor Car Company, Buffalo, N. Y., representing the Thomas car in the South and in Mexico. Previously, he was associated with the sale of Panhard cars in New York City.

DICKSON BELIEVES IN QUALITY.

George M. Dickson, General Manager, National Motor Vehicle Company.

George M. Dickson, general manager of the National Motor Vehicle Company, Indianapolis, Ind., whose likeness is shown herewith, believes in Quality with a capital Q. Mr. Dickson is a graduate from the bicycle industry, and even his competitors were compelled to admit that he understood the selling end of that business. Despite the fact that he is still young in years, he is a veteran in the manufacture of motor vehicles, having been connected with the production of National cars for a number of years and general manager of the company for some time. Like most successful men he has some very well defined ideas as to how the automobile business should be conducted. After 12 years of experience he is justified in feeling that he can offer a few suggestions, and among these is that of Quality. Mr. Dickson says that no matter how large the factory may be, and no matter anything else, a motor car must be measured by but one standard—Quality. He adds that even if the builder wanted to unload an inferior product upon the people he would be unable to do so, because the public is now motor-intelligent. He also takes comfort in the fact that every day sees the sum total of motor-intelligence increased, and holds that this is the salvation of the industry.

JOINS ABBOTT MOTOR COMPANY.

Clinton E. Bailey, Vice President, Abbott Motor Company.

At a recent meeting of the directors of the Abbott Motor Company, Detroit, maker of the Abbott-Detroit line, Clayton E. Bailey of Jamestown, N. Y., was elected first vice president of the company and chairman of the board. For several months past C. W. Jamieson, president of the company, has been seriously ill and his condition is regarded such as to compel the selection of a man capable of assuming direct charge of the business.

Mr. Bailey has been associated in other business enterprizes with several of the principal stockholders in the Abbott company for a number of years, and recently acquired a heavy financial interest in this concern. He is well known in New York City as a financier and manufacturer and brings to the Abbott company a wide knowledge of business methods.

For several years he has been president and the moving spirit in the Bailey Table Company at Jamestown, one of the largest and most successful furniture manufacturing establishments in that section. He also has been closely allied with the management of numerous other manufacturing and financial institutions in that city. In addition he has large financial interests in the Southwest and has shown a very considerable amount of strength in handling transactions involving large capital with business interests in New York City.

It is anticipated that Mr. Bailey's policies, which are conservative and at the same time progressive, will continue to develop the business of the Abbott Motor Company and cause it to become one of the best manufacturing concerns in the industry. It is Mr. Bailey's intention to remove his family to Detroit and take up his permanent residence there in the immediate future.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from February Issue.)

The method of operation of the independent system is by what is known as the closed circuit plan, the armature being short circuited while the contact points are closed, though as soon as the circuit is broken, the current generated in the winding must take the longer path which includes the primary of the induction coil. Thus, as soon as the points separate, there is a sudden rush of current through the transformer, and a high-tension current is produced in the secondary as previously described.

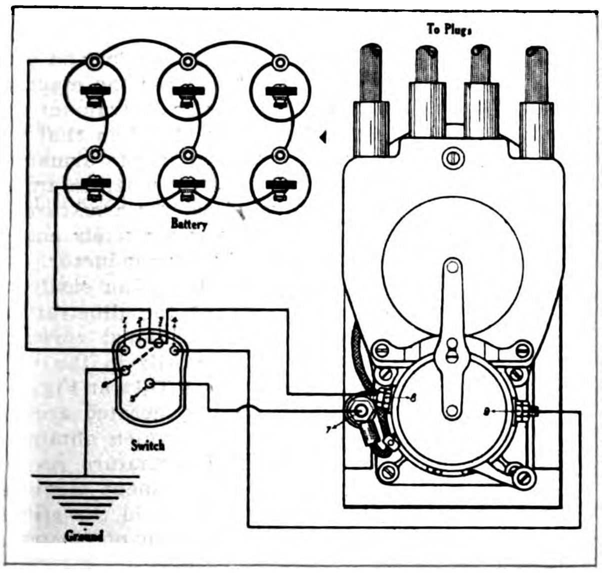


Fig. 18—Wiring Pfanstiehl Dual System.

When used in connection with a set of batteries, there is a slight change in the contact breaker, consisting of adding another terminal 9, as shown in diagram Fig. 18. This makes three terminals, 7, 8 and 9 as indicated, whereas the magneto, when used alone requires but two.

The location of the transformer coil makes it possible to cut it in either a battery or magneto circuit, depending upon the switch lever position. We have seen that one end of the coil was grounded, while the other end is brought out to terminal 7, which is coupled to terminal 5 at the switch, this making contact with the switch arm. Connections 4 and 9 carry current from armature to switch, and the wire leading from 3 to 8 permits the magneto to operate as a self-contained instrument when the switch lever is in magneto position. One end of the battery is connected to point 3, the other to terminal 1, but as the circuit is open when the switch lever is either in magneto or off positions, the battery is inoperative at this time. The wire connecting switch terminal 3 to contact breaker terminal 8 forms the connection whereby the armature current is intermittently connected and separated by the breaker points.

When the switch lever is thrown to battery side, coil connection 7 is placed in circuit with 5 and 1, making it possible for the battery current to flow to the coil. In longitudinal section shown at Fig. 17, in February issue, connection A corresponds to and is coupled with terminal 7. The other battery lead is intermittently grounded at terminal 8. A push button is provided at the side of the switch for starting, when this is depressed the ground connection 6 is brought into electrical connection with point 3, and the battery current is grounded through a short shunt instead of by the contact breaker points at terminal 8. With this system one taps the button instead of maintaining a continual contact as with the vibrator previously described. Attention is called to the method of battery connection advocated by the Pfanstiehl engineers. While six cells are used, one utilizes only the voltage of two cells because of the series-parallel connection. This is sufficient as the resistance of the primary of the transformer coil is so proportioned that the core is energized with very low potential current.

In the Pittsfield magneto, the current is produced by transforming mechanical energy into electric power through a distinctive principle depending upon induction. The rotating member employed, as can be seen at Fig. 19, which depicts a longitudinal cross section, or at Fig. 20, a lateral section, is an inductor composed of laminated iron sections. This revolves through a magnetic field formed by permanent steel magnets. The winding, instead of being on the inductor, is placed at the back of the instrument and is stationary. It is a complete transformer coil in itself and is so placed between the pole pieces that it may be easily removed, core and all, and a new one substituted should this be necessary because of damage. The coil consists of two windings, a primary and secondary, and the principles of operation are the same as in those previously described, and the high-tension current is distributed by the usual means. The contact breaker is located between the coil and the bearing plate of the inductor, and is easily reached by removing the transformer.

Referring to lateral cross section Fig. 20, it will be seen that the field has four pole pieces instead of two as in the usual type of instrument. Two of these are attached in the conventional manner to the magnets, the others, together with the iron core of the transformer coil, are also in the magnetic field. The rotation of the inductor in the field serves to reverse the flow of magnetism alternately from the magnets to the pole pieces forming a magnetic circuit with the transformer coil core. While it is possible to obtain a change in magnetic strength four times a revolution,

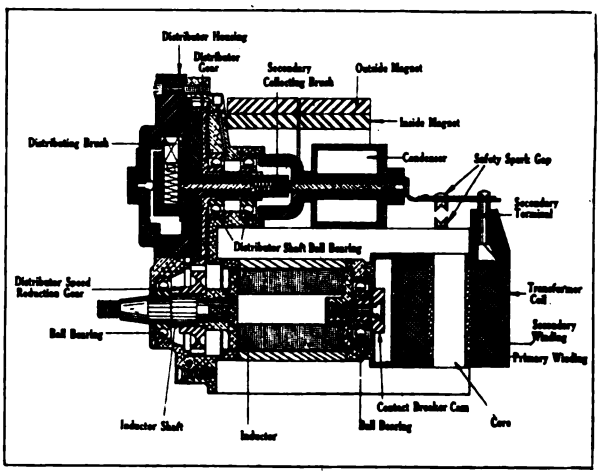


Fig. 19—Pittsfield Inductor Magneto Employs Stationary Winding and Works on Distinctive Principle.

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

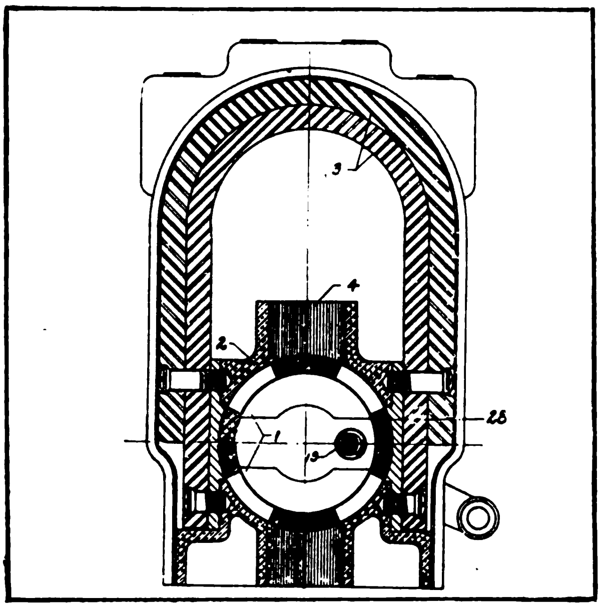

Fig. 20—Lateral Cross Section Pittsfield Magneto.

or for each 90 degrees rotation of the inductor instead of for every 180 degrees as in other instruments, a two-point cam is fitted to the revolving member and the maximum current is obtained but twice each revolution, so that the magneto may be run at twice the crankshaft speed when applied to a four-cylinder engine, just as other makes. When the magnetic flow reaches its maximum in the coil core, the contact breaker points separate and a high-tension impulse is obtained in the secondary coil of the transformer.

The timing arrangement is different from that of other magnetos, and it is claimed that a variation of timing of 30 degrees is possible without reducing the efficiency of the spark, which is the same either at maximum advance or retard. The change of timing is effected through changing the position of the coil field poles by means of an oscillating sleeve on which the interruptor is fastened, this being actuated by the spark advance lever. The sleeve consists of four pole pieces of magnetic material mounted between ends of non-magnetic metal, and when oscillated serves to distort the magnetic flux, and at the same time, causes the contact points to separate sooner or later in relation to the engine piston travel and thus vary the time of sparking in the cylinder. The effect of changing the position of the sleeve pole pieces is exactly the same as though the main pole pieces shifted to the maximum magnetic flux would flow through the transformer coil core when the contact points were separated regardless of the time of breaking the circuit relative to the crankshaft travel.

Wiring Pittsfield Magneto Systems.

The Pittsfield magneto is intended to be used either as a single source of ignition, in which case it is coupled to the engine in just the same manner as any high-tension device, or as one group of a double system in which a separate battery timer and coil as well as a distinct set of plugs is provided either for starting or regular use. The diagram Fig. 21 shows the wiring of such an ignition method. The various parts should be easily distinguished, but as a guide letters are used as follows: A, magneto; B, battery timer; C, magneto and battery switch; D, spark plugs; E, four-unit vibrator coil; F, batteries; G, ground; H, battery switch connection; K, magneto switch connection; a, secondary lead from magneto to plug; a 1, conductors from coil to plugs; b, primary lead from magneto to switch; b 1, wire from switch to batteries; c, connections between timer and coil, and e, conductors from coil to batteries. Considering the matter previously presented, it should not be difficult to trace the wiring of either the battery or magneto systems.

We have considered magnetos of the high-tension type in which the low-tension current produced in the single winding of the armature was stepped up to one of higher value, in a separate transformer that was mounted on the dash in one instance, or formed part of the magneto as it was housed between the magnets in other forms. The true high-tension instrument differs from the forms previously considered in that the current of high voltage is produced in the armature winding direct, without the use of a separate transformer. Instead of a single winding, the armature of such devices carries two, one of comparatively coarse wire, the other of many turns of finer conductor.

The arrangement of these windings can easily be ascertained by reference to any of the illustrations presented herewith that show the sectional views of typical high-tension magnetos, especially in the view of the Bosch D4 at Fig. 22 and Bosch DU4 at Fig. 23. The current in such instruments is generated according to the same principles as those which obtain in the low-tension devices, the shuttle armature revolving between the poles of strong permanent magnets. The rotation of the armature windings in the strong magnetic field results in the production of electrical energy by induction.

How Bosch Magnetos Operate.

If we refer to Fig. 24, which is a diagram of the principal parts of the Bosch DU4 magneto, the mode of operation can easily be determined and the principle involved can be applied just as well as to other instruments of the same type. The armature is shown separate from the magneto so the wiring can more easily be understood. It is well to remember that the current is produced in the armature winding twice each revolution, or at intervals of 180 degrees rotation, therefore one may obtain a spark each half revolution of the armature of a four-cylinder magneto.

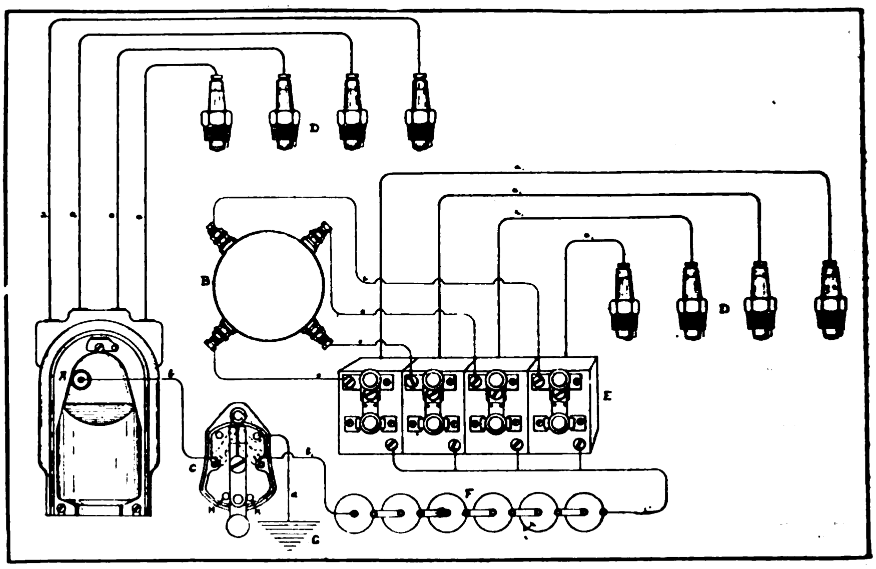

Fig. 21—Pittsfield Magneto Used in Connection with Battery System.

The shuttle is wound with two windings, one being a continuation of the other. Of these the inner winding, indicated by the coarse lines C1 is the primary consisting of a few turns of heavy wire, while the other, C2 is the secondary coil consisting of many turns of fine wire. One end of the primary winding is coupled to and is grounded to the armature core; the other passes to the insulated part of the interrupter. While in some forms the interrupter does not revolve, the desired movement to separate the contact points being produced by a cam mounted on the armature shaft, in the form shown, the contact breaker mechanism turns with the armature and the points are separated by cams on the timer casing operating a trip lever to which one of the platinum contact points g3 is fastened. The insulated member g2 is adjustable in the supporting block so the distance between the points may be varied to obtain the best results and so the gap between them when they are separated by the cam can be maintained the same even when they flatten out a little after constant use.

Utility of Contact Breaker.

This arrangement of having a revolving contact breaker mechanism and normally stationary cams permits one to conduct the current from the revolving primary coil to the interrupter by a direct connection, eliminating the brushes that would otherwise be necessary. During the revolution of the armature the grounded lever makes and breaks contact with the insulated point, short circuiting the primary winding upon itself until the armature reaches the proper position of maximum current production at which time the points g2 and g3 are separated by the cam. Normally, the contacts are together and the currents generated in the winding, which are comparatively feeble, have no effect on the secondary coil because the primary winding is short circuited upon itself, flowing through the conductor "f" to the insulated member and thence back to the ground through the grounded contact lever.

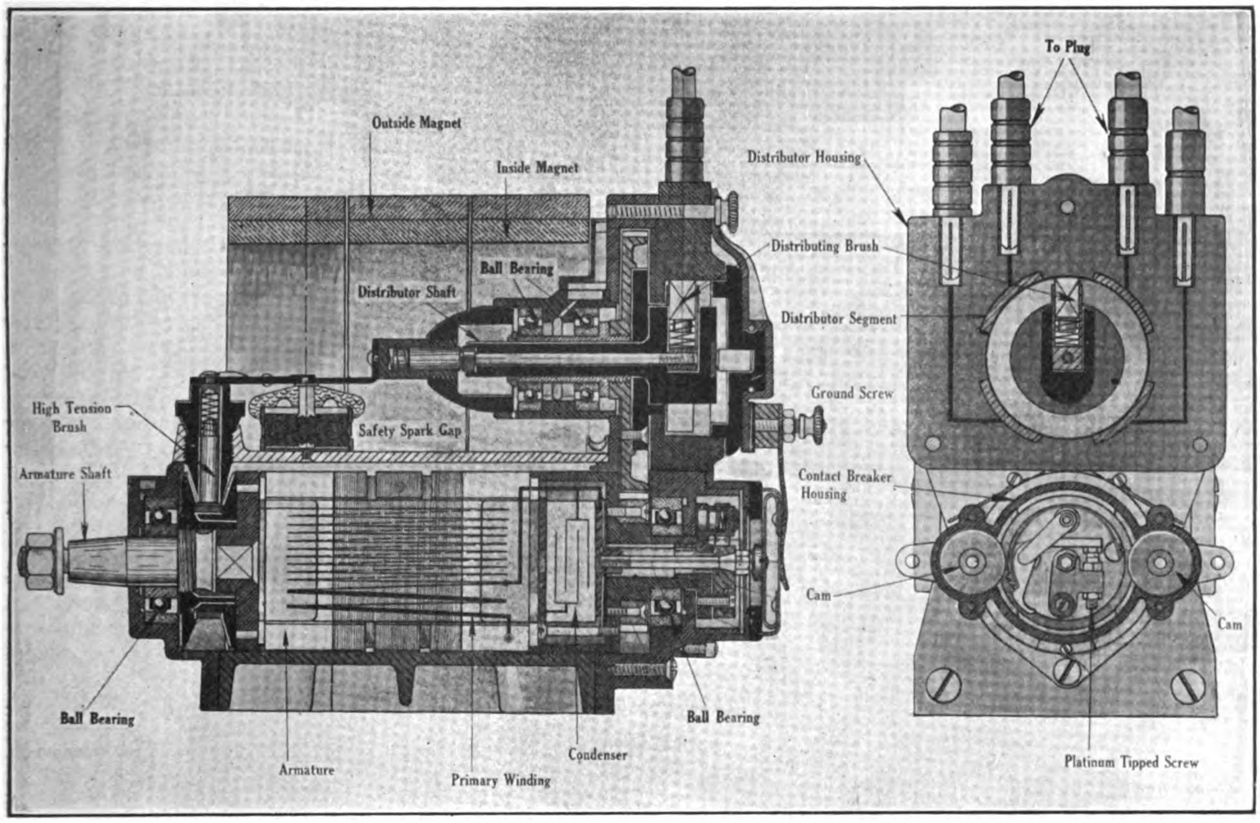

Fig. 22—Sectional Views of Bosch D4 True High-Tension Magneto, Which Employs Double Armature Winding.

The arrangement of the secondary winding is also shown in the diagram, one end being attached to the live end of the primary where it joins the conductor leading to the insulated contact point g2, while the other is coupled to the collecting ring carried by the insulator at the driving end of the armature. A carbon brush collects the high-tension current, and by means of the conductor "1" it is delivered to the revolving brush of the distributor n1.

It will be evident that as long as the contact points are together, providing a short circuit for the small currents induced in the primary there will be no production of high value current in the other winding. When the current reaches a maximum value, because of the armature being in the best position, the cam operates the interrupter and the points are separated, breaking the short circuit that existed while they were together. The secondary circuit has likewise been open while the distributor arm has moved from one contact to another, and there has been no flow of energy through this winding. While the pressure will rise in this, even if the distributor arm made contact with one of the segments, there would be no spark at the spark plug until the contact points separated, because it is only when the armature is at the position of maximum current production that the secondary current has sufficient value to overcome the resistance of the air gap between the plug electrodes.

How Spark Is Produced.

When the air gap exists between the contact breaker points the maximum primary current is diverted from the short circuit and can flow to the ground only through the secondary winding and the spark plug circuit. The high pressure now existing in the secondary winding will be greatly augmented by the sudden flow of primary current and electric energy of high enough potential to successfully bridge the gap at the plug is thereby produced in the winding, which is diverted to the cylinder to be fired by means of the distributor mechanism.

As the arc-like spark can only be produced when the armature is in a certain position and as the ignition has to take place at a certain period in the movement of the piston, it is necessary that the armature be positively driven at the same speed as the engine when the magneto is applied to a four-cylinder engine of the four-cycle type. The gear wheel that carries the distributor carbon brush n 1 is so arranged that it revolves at the same speed as the camshaft of the motor. The variation of the time of ignition is effected on the magneto itself by means of the timing

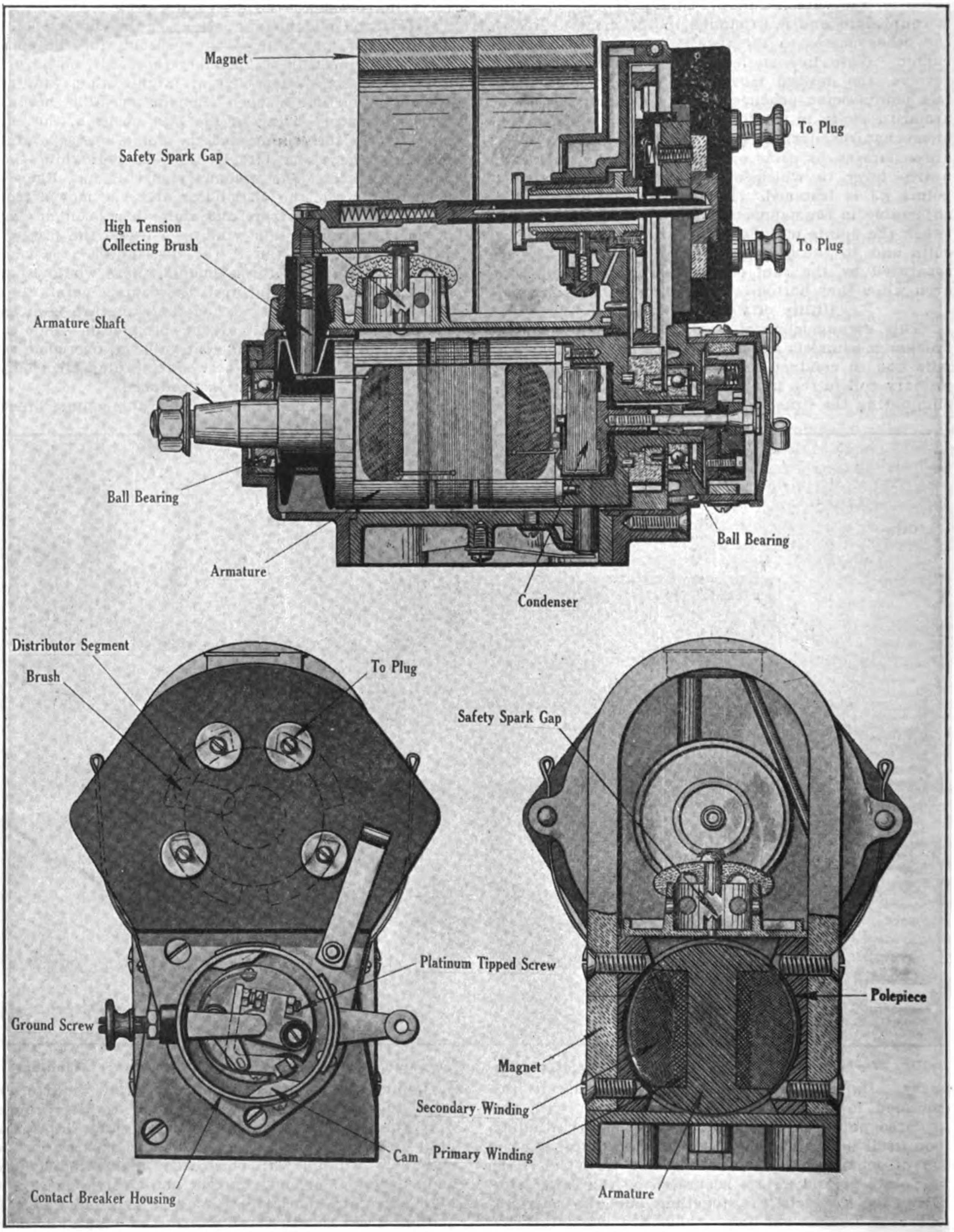
Magnet
To Plug
Safety Spark Gap
To Plug
High Tension Collecting Brush
Armature Shaft
Ball Bearing
Ball Bearing
Armature
Condenser
Distributor Segment
Brush
To Plug
Safety Spark Gap
Platinum Tipped Screw
Polepiece
Ground Screw
Magnet
Secondary Winding
Cam
Primary Winding
Contact Breaker Housing
Armature

Fig. 23—Sectional Views of the Bosch DU4 Magneto, Showing Arrangement of Principal Parts.

lever p, which rocks the contact breaker housing in which the cams are carried so that the interruption of the primary current short circuit will take place earlier or later as the case may be.

Function of Safety Spark Gap.

All modern steam installations are provided with a safety valve so that if the steam pressure in the boiler becomes so high that the safe factor of strength of the boiler tubes or shell is likely to be exceeded, a portion of the pent-up steam will be released to the outer air. Owing to the high-tension of the secondary current, magnetos are provided with a device that acts in the same manner. If by chance a spark plug wire should become broken, the pressure of the electrical energy in the windings would be sufficient to rupture the insulation in seeking a short path to the ground.

To guard against the damage from this cause, most high-tension magnetos have a spark gap, this consisting of two points, as outlined at k, Fig. 24; one being connected to the secondary conductor that leads to the distributor brush, the other with the ground as represented by the metal housing of the magneto. As long as the current can pass over a gap having less resistance than that of the air space between the safety spark gap points, possible as long as the leads to the spark plugs are properly connected, the spark gap is inoperative. Should a wire become loose and sufficient current be generated to damage the windings, the pressure is high enough to permit the electric force to overcome the resistance of the air gap and pass to the ground. Most devices of this nature are set so current in excess of 14,000 or 15,000 volts will jump the gap. When a transformer coil system is used, the safety spark gap is often located on the coil box. In the true high-tension magnetos it is commonly placed between the magnets as indicated at Figs. 22 and 23.

Why a Condenser Is Needed.

The condenser, which is often carried with the armature, consists of a number of conducting surfaces in two sets, those of one assembly being insulated from those of the other by mica or other insulating material. Its purpose is to absorb excess static charge present in the spark or arc, which is evidenced when the points are separated. The location of this essential varies with the design, some makers mounting it on the armature, which, of course, eliminates sliding contacts, as at Figs. 23 and 24, while others place it between the magnets on the top of the pole pieces. If a condenser were not provided, the static effect of the current would tend to burn the contact points because of the intense heat, the temperature of the arc occurring between them being sufficient to fuse the platinum.

To interrupt the operation of this type of magneto, one permanently short circuits the primary winding. This is accomplished by an insulated wire connected from nut r 1 to the switch, the other pole of the latter being connected to the motor frame or ground. As soon as the switch lever is closed the current passes over the contact r 1, the spring r 2 and the switch and wiring leading to it from the magneto and from the switch to the ground and the action of the contact breaker has no effect upon opening the circuit.

Bosch Dual System Outlined.

The Bosch magneto is made in many types and sizes, the most popular for large cars being that shown at Fig. 22, while a type that has received wide application on smaller and lighter cars is that outlined in the large plate, Fig. 23. The most popular arrangement of these instruments when used for automobile ignition is either in connection with a "dual" or "duplex" ignition system.

The DU4 magneto, when applied in a dual system, differs from the regular independent type in several details. One of the first to be noticed is an additional binding post on the face of the distributor, this serving to conduct the high-tension current from the switch to the distributor, whether the current of high potential originates in the magneto or in the coil. In the type shown at Fig. 23 the high-tension current is led from the armature to the distributor brush by a conductor that is located under the arch of the magnets. One of the changes necessary on the magneto to use it for the dual system is to break this circuit, as the secondary current should flow to the distributor from but one source at a time.

The details of the interrupter are also different, as will be evident from examination of the contact breaker. It will be noted that a second lever is located under contact breaker housing in a separate housing, the function of this being to interrupt the battery circuit. Whereas the parts of the magneto contact breaker turn with the armature and are operated by stationary cams, the battery timing lever is stationary and is operated by a revolving cam that is located directly behind the disc that bears the parts of the magneto interrupter. The magneto and battery cams are set at such relation to each other that the interruption of the battery and magneto circuits are simultaneous. The coil that is utilized in connection with the battery is intended to be used in a horizontal position and is located on the dash of the car. The only part of the device that is visible from the seat is the end plate carrying the switch handle.

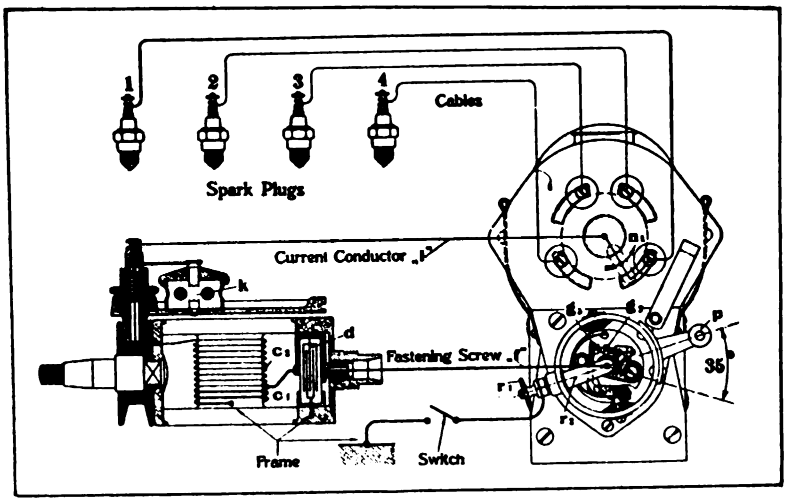

Fig. 24—Principle of Bosch High-Tension Magneto Action.

Under normal conditions the operation of the engine with the switch thrown to battery position will be due to the production of a single spark, which occurs in absolute synchronism at the instant the circuit is broken by the battery timer. In order to permit self-starting, however, the coil is provided with a vibrator that may be brought in action by pressing a button independently of the battery timer. A four-cylinder engine will usually stop with the crankpins in a horizontal position; that is, the piston in the cylinder about to fire is part of the way down on the power stroke. Just as soon as the vibrator button is pushed, a spark takes place regardless of the contact breaker lever position and if there is any explosive mixture in the cylinder, ignition will result and the engine will start.

(To Be Continued.)

CAUSES OF BLOWING EXHAUST JOINTS.

A clogged muffler will develop trouble and this reducer of the exhaust noise is responsible for faults usually laid to other components of the power plant. Sometimes it is difficult to fit packings in the joints of the exhaust manifold when these members are not parallel. This may be due to the cylinders not being lined up where multi-members are cast singly, and fitted over studs in the crankcase. In tightening up the manifold one or more packings may not be compacted as snugly as the others and these will leak in time, which is denoted by a hissing noise. It may not always be the fault of the work and may be brought about by the muffler being stopped up and creating a strong back pressure in the manifold and at the joints. When such is the case there is a tendency to blow the packings. This also may be caused by the opening of the latter being made smaller than that of the port.

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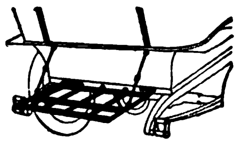

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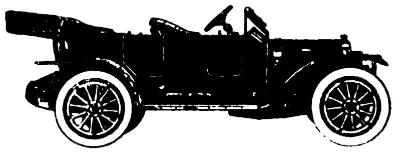

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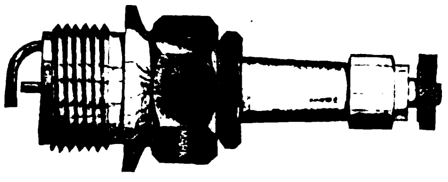

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Ideal Motor Car Co., Indianapolis, Ind. (Stuts.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Inter-State Automobile Co., Dept. N, Muncie, Ind. (Inter-State.)
Branch: 153 **Massachusetts Ave.,** Boston, Mass.

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.)

Marquette Co., The, Detroit, **Mich.** (Marquette.)
Branches: New York City, Chicago, Boston.

Maxwell-Briscoe Motor Co., 3 West 61st street, New York City. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead road, Trenton, N. J. (Mercer.)

Michigan Buggy Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis, Ind. (National.)

Oakland Motor Car Co., 1300 Oakland Ave., Pontiac, Mich. (Oakland.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

R-C-H Corporation, 107 Lycaste St., Detroit, Mich. (R-C-H.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st street, New York City (Sampson.)

BUYERS' GUIDE---Continued

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit, Mich. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st street, New York City. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Available Truck Co., 2334 Hamilton Ct., Chicago, Ill. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st street, New York City. (Brush.)

Cartercar Co., Pontiac, Mich. Cartercar.)

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st street, New York (Sampson.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st street, New York City. (Sampson, Brush, Stoddard.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit, Mich. (G. M. C.)
Branches: See Cars, Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st street, New York City (Sampson.)

United States Motor Co., 3 West 61st street, New York City. (Sampson.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo, N. Y. (Victor.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CHAINS, TIRE.

Weed Chain Tire Grip Co., 28 Moore St., New York City. (Weed.)

CHAINS — TRANSMISSION OR DRIVING.

Miller, Chas. E., 97-103 Reade St., New York City (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES — AUTOMOBILE FRICTION.

Brets Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CRANES.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tanks for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

GAUGES, ETC.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Tire Pressure and Gasoline Tank Gauges.)
Branches: In all principal cities.

HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

HORNS—BULB, ELECTRIC, EXHAUST.

Automobile Supply Mfg. Co., 220 Taaffe Place, near DeKalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston, Mass. (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.
Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.; 801 Woodward Ave., Detroit, Mich.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING EQUIPMENT — ELECTRIC.

Esterline Company, The, La Fayette, Ind. (Matchless.)
Branches: Detroit, Mich.; San Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 310½ Chapel St., New Haven, Conn.

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York City.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 2329 Chester Ave., Cleveland, O.

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Brets Co., J. S., 250 W. 54th St., New York City (U. & H.)

K-W Ignition Co., The, 2329 Chester Ave., Cleveland, O.

BUYERS' GUIDE---Continued

Marburg Bros., 1777 Broadway, New York City (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.

Branches: 1679 Broadway, New York City; 1110 South Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-436 Van Ness Ave., San Francisco, Cal.; 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MEASURES, ETC.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MOTORCYCLES AND MOTORCYCLE SUPPLIES.

American F. N. Co., Boston (F. N.)

Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

International Automobile Association, Shelden M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 122 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

OILS, GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)

Branches: Boston, Mass.; Fall River, Mass.; Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)

Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.)

Branch: 143 No. Wabash Ave., Chicago.

Harris Oil Co., Muncie, Ind. (Autoil.)

Havoline Oil Co., 17 Battery Place, New York City (Havoline.)

Branches: Pacific Coast — Kohl Bldg, San Francisco, Cal; Western—People's Gas Bldg., Chicago, Ill.; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul, Minn.

Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Hawes, Geo. A., 77 Pine St., New York City. (Panhard.)

Branch: 899 Boylston St., Boston.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)

Branch: 284 Columbus Ave., Boston, Mass.

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.)

Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)

Branches: 126 Massachusetts Ave., Boston, Mass.; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)

Branches: In all cities.

Texas Company, The, 7 West St., New York City.

Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)

Branches: 49 Federal St., Boston, Mass.; 605 Brown Bros. Bldg., Philadelphia, Penn.; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., 80 Broad St., New York City (Wolverine.)

Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.; 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE PUMPS, ETC.

Ideal Oil Pump & Tank Co., 146 Summer St., Boston, Mass.

Randall-Faichney Co., Boston, Mass. (B-Line.)

POLISHES.

Harris Oil Co., Muncie, Ind. (Metal, Wood, Leather.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

RADIATORS.

Eureka Auto Parts Mfg. Co., 3100 Olive St., St. Louis, Mo. (Eureka.)

RIMS — REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.

Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)

Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)

Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

Webb-Veitch Co., 1777 Broadway, New York City. (Invex.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland, O. (L B A.)

Branches: 136 West 52nd St., New York City; 1191 Woodward Ave., Detroit, Mich.; 436 South Dearborn St., Chicago, Ill.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)

Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia, Penn. ("J-M.")

Branches: 218 W. 84th St., New York City; 222 Eliot St., Boston, Mass.; Teck Building, Buffalo, N. Y.; 10 W. Eager St., Baltimore, Md.; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

SOAPS.

Harris Oil Co., Muncie, Ind.

Hopewell Brothers, Newton, Mass. (Paos.)

Branch: 1974 Broadway, New York City.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.

Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Frontier Specialty Co., 734 Main St., Buffalo, N. Y. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Mac-Kae Manufacturing Co., Boston, Mass. (Mac-Kae.)

Rex Ignition Manufacturing Co., 1779 Broadway, New York. (Rex.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.

Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Mac-Kae Mfg. Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORDING DEVICES.

Jones Speedometer, New Rochelle, N. Y.

Branches: Broadway and 76th St., New York City; 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)

Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.;

BUYERS' GUIDE---Concluded

1212 South Main St., Los Angeles, Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.) **Branches:** 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 870 Woodward Ave., Detroit, Mich.; 330½ North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis, Mo.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Ideal Oil Pump & Tank Co., 146 Summer St., Boston, Mass.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Ignition Co., 2829 Chester Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.) **Branch: 1974 Broadway, New York City.**

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.) **Branches:** 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Empire Tire Co., Trenton, N. J. **Branches:** 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia.

Firestone Tire & Rubber Co., Akron, O. **Branches:** See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass. (Fisk.) **Branches:** 811-813 Boylston St., Boston, Mass.; 17½ Dorrance St., Providence, R. I.

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.) **Branches: In principal cities.**

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.) **Branches:** See Rims—Removable and Detachable.

Western Automobile Supply Co., 3900 Sheridan road, Chicago, Ill. (Auto Inner Casings.)

TIRE INFLATING TANKS.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PROTECTORS.

New Tyr Manufacturing Co., 771 Lexington Ave., New York City. (New Tyr.)

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.) **Branches: New York, Chicago, Detroit, Kansas City, Cleveland.**

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.) **Branches:** See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.) **Branches:** See Tire Casings and Inner Tubes.

Firestone Tire & Rubber Co., Akron, O. **Branches:** See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass. **Branches:** See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.) **Branches:** See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York City. **Branches:** See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.) **Branch: 1974 Broadway, New York City.**

TRUCK BODIES.

Lynch Manufacturing Co., Hammond, Ind. **Branches:** East Chicago, Ind.; South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit, Mich.

TUBING, GAS.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Canton Foundry & Machine Co., Canton, O. (Universal.)

Lansing Co., formerly **Lansing** Wheelbarrow Co., Lansing, Mich. **Branches:** Factory, Parkin, Ark.; 78 Cambridge St., Boston, Mass.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, Hartford, Conn. (Kant-Break.)

VALVE DRESSERS.

Crane, F. G., 331 Genesee St., Buffalo, N. Y.

VULCANIZERS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Garage and Individual.) **Branches:** In all principal **cities.**

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WINDSHIELDS AND WINDSHIELD CLEANERS.

Conover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, Geo. A., Taunton, Mass.

Walworth Mfg. Co., Boston, Mass. (Stillson.)

THE ACCESSORY AND GARAGE JOURNAL
Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. I. PAWTUCKET, R. I., APRIL, 1912. No. 6

NEW FACTORIES INDICATE PROSPERITY.

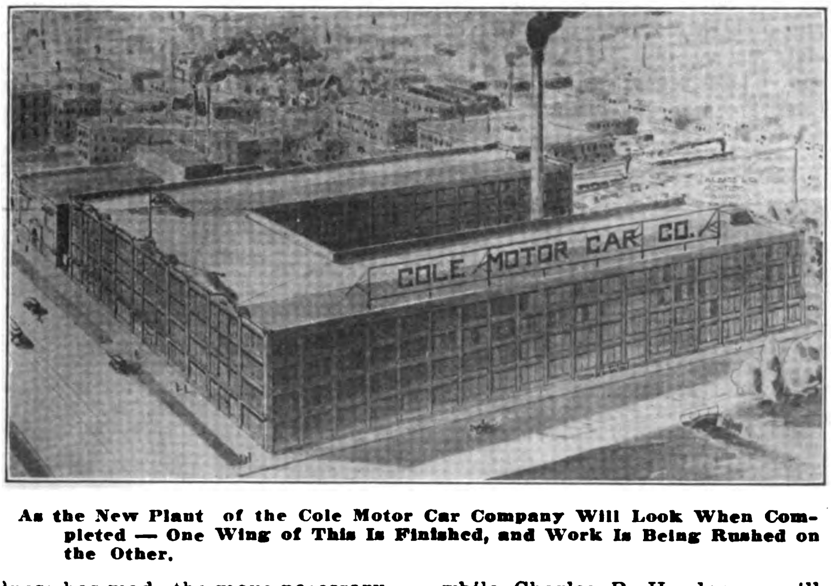
Condition of the Industry Is Reflected in the Erection of Substantial Structures to Take Care of the Increasing Business of Five Well Known Firms Producing Motor Cars, Parts and Accessories.

NO BETTER evidence of continued prosperity, having in mind particularly the automobile industry, is needed than can be found in the demand for additional production facilities. Several concerns throughout the country have found it necessary to erect substantial additions to their plants, and as it is generally admitted that there is a tendency among manufacturers in any line to be more or less cautious during an election year, any news of expansion along this line at this time is of special interest to those in the trade.

The plans of at least five firms in three states have progressed sufficiently to admit of presenting their details herein. Indianapolis, Ind.; Hartford, Conn., and Jamaica Plain, Mass., each will have a new factory, and it is estimated that the total cost of these three structures will reach close to half a million dollars. In each case, the firm's increased business has made the move necessary.

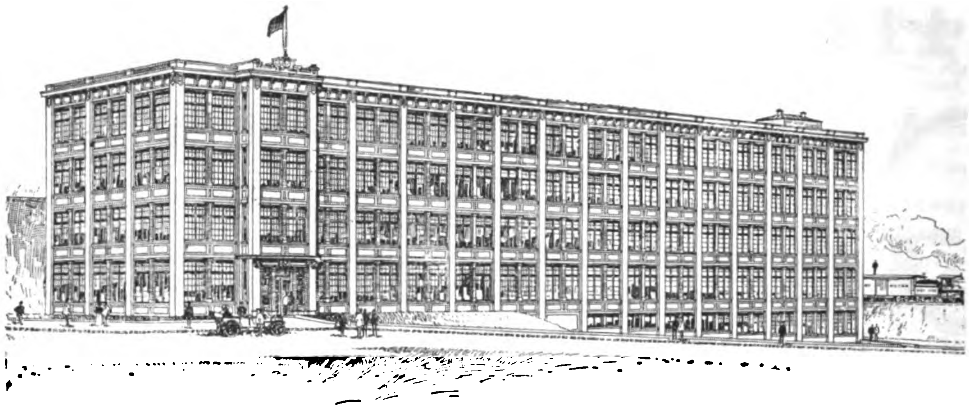
In Indianapolis, the Cole Motor Car Company, maker of the Cole car, has just occupied the first wing of its new factory, and construction is being rushed on the other wing. The one just finished cost $100,000 and the second wing will be a duplicate of the first. Each will be four stories high, of reinforced concrete in an especially light and airy construction. They will be 100 by 160 feet, in the rear of factory No. 1. When both are completed the Cole organization will have a U shaped building 230 by 315 feet, four stories high. The foundations and walls have been so designed that two stories may be added at any time, whenever the pressure of orders makes it necessary. The Cole company has three other buildings in Indianapolis, all working to their full capacity, so the fact that the addition was necessary gives some idea of how the prospects for the future look to the Cole people.

It will be remembered in this connection that the Henderson Motor Sales Company, which has been the distributing agent for the Cole product since the organization of the company, has been purchased by the Cole Motor Car Company, and will become the sales department of that organization July 1. This does not mean that there will be any decided change in the management of this end of the business. President J. J. Cole will continue in direct personal charge of the production while Charles P. Henderson will be retained in his new capacity as sales manager.


COLE MOTOR CAR CO.

As the New Plant of the Cole Motor Car Company Will Look When Completed — One Wing of This Is Finished, and Work Is Being Rushed on the Other.

In Hartford, Conn., the Pope Manufacturing Company, maker of the Pope-Hartford cars, is to erect a big modern four-story building that will double the output of the factory. The erection of this will mean an important addition to the company, and to the city of Hartford as well, and will be of interest to the automobile trade as an indication of how the Pope forces are preparing for expansion. The number of hands employed will be increased by several hundred.



Modern Concrete Factory Building to Be Erected in Jamaica Plain, Mass., and Occupied by the Randall-Faichney Company, the Mac-Kae Manufacturing Company, and the Babson-Dow Manufacturing Company.

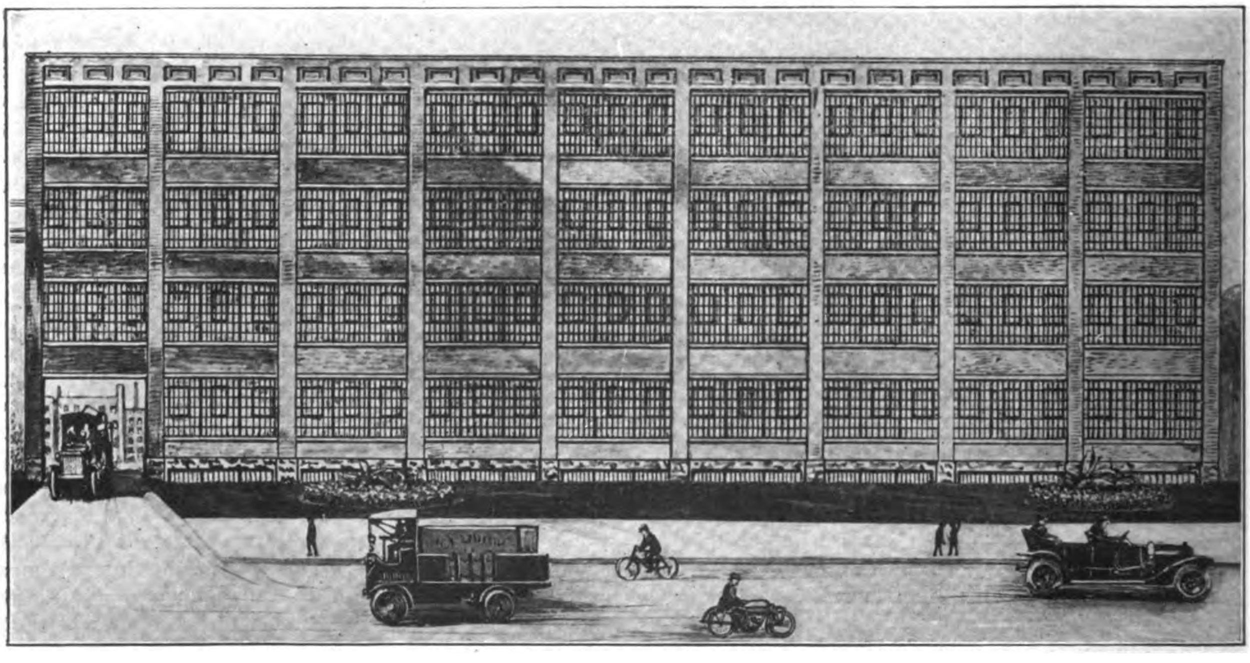
Plans for the new building have been drawn, specifications have been finished and placed in the hands of contractors for bids, and it is expected that construction will be started shortly. It is hoped to have the work completed by September, if not before, as it is to start in June. That the company is badly in need of more space may be seen in the fact that the superintendent's office, at present in the factory, will be moved in June into the rooms of what is now station A of the postoffice, which is to be located elsewhere. The new building will extend from the eastern face of station A to the driveway near the main office building, and will connect with the present factory office.

The new structure will contain four stories and a basement, and will cover an area of 192 by 72 feet. The elevators, stairs and toilets are to be located outside in a tower, which will be fire proof, affording a fire escape of the most approved pattern. The convenience and comfort of the employees have been carefully considered, and large windows fitted with steel sash will admit plenty of light and air. The columns will be widely spaced, and the floors will be shallow and girderless. The basement, into which cars will be run under their own power down a runway from the yard, is to have a special ventilation system that will remove all vapors and gases, discharging them through the roof. The ceilings will be flush, eliminating pockets in which gases might collect. Two large elevators, the largest in the city, will be installed. They will have platforms 25 feet long, and will safely carry a loaded truck weighing 10 tons.

The third factory is to be built in Jamaica Plain, Mass., and will be occupied by three firms, all making automobile parts and accessories. The building will be owned by the Randall-Faichney Company, which will occupy the larger portion of the space. This concern is well known in the industry, making a large line of accessories, of which the Jericho horn is perhaps the most prominent. It also produces oil and grease guns, and makes a specialty of precision work.

The Mac-Kae Manufacturing Company will occupy a part of the new structure, where it will continue the production of the well known Mac-Kae spark plugs, terminals, timers, and other electrical accessories, as well as tire holders, tools, etc.

The other concern which has secured space in the new building is the recently organized Babson-Dow Manufacturing Company, which will place in the mar-



The New Pope-Hartford Plant in Hartford, Conn., Which Will Double the Output of the Company.

ket a complete line of screw machine products in all metals. The general manager of the new concern, which is capitalized for $100,000, is Rodger D. Babson, who has had wide experience in the automobile industry. He was until recently the Boston agent for the Hartford Machine Screw Company. The factory will be in charge of Mr. Dow, who was for 15 years in charge of the machine screw department of the United Shoe Machine Company.

The building will be erected on Atherton street near Boylston station and along the railroad, so that ample facilities will be afforded for shipping the products of the three concerns. It will be four stories high, 60 by 250 feet, with basement, and will contain a total of 67,000 square feet of floor space. The exterior, as may be seen from the accompanying illustration of the architect's drawing, is pleasing, and it may be stated that the interior will be in keeping. Every modern convenience for the dispatch of business and the health and safety of the employees will be provided, and the factory will be a model one in every particular.

Light and power throughout will be electric, and the installation is being planned by electrical engineers who will produce an ideal equipment. Current will be furnished by the Edison Electric Illuminating Company. While the factory will be near the railroad, one end adjoining the right of way, a lawn with flower beds and shrubbery is planned, with the idea of making the external appearance as creditable as possible for the occupants and the town as well.

CONCERNING GRAPHITE AND GREDAG.

In the March issue of the Accessory and Garage Journal, one of the cut lines in the article dealing with the various lubricants produced by well known manufacturers was unfortunately so worded as to convey a possible misunderstanding. Reference is had to that reading, "Lubricants: Dixon's Graphite and Gredag." The illustration was that of two cans containing graphite products, the first being Dixon's Graphite, produced by the Joseph Dixon Crucible Company, Jersey City, and the other, Gredag, made by the International Acheson Graphite Company, Niagara Falls, N. Y. It is unnecessary to state that there was no intention to convey the impression that Gredag was manufactured by the Dixon concern, and the article accompanying the illustration explained this matter clearly. However, the wording of the cut line was such as to occasion some confusion.

UNUSUAL CARBURETOR TROUBLE.

The use of a chamois or a screen fine enough to prevent the passage of water in replenishing the fuel supply is more essential in winter than during warm weather because in some types of carburetors the water is likely to collect and freeze, creating starting troubles. An instance of this kind was noted recently.

The vaporizer was an old one and the cork float was contained in a separate chamber from the spraying nozzle, and was fitted with a threaded stem, the lower end of which became locked in a mass of ice caused by an accumulation of water in the fuel. It is needless to state that the operator of the car experienced considerable trouble before he located the cause.

THE INDUSTRY IN NEW YORK.

According to an advance bulletin on manufactures for the State of New York, based upon the 13th census, and issued by the Department of Commerce and Labor, the automobile industry in that commonwealth arose from 126th place in 1899 to 73rd in 1904 and 23rd in 1909. These figures show that the number of establishments engaged in the manufacture of automobiles, bodies and tops has increased from 15 to 113 in 10 years, and that the capital involved has been increased from $639,000 to $25,102,000. Of course, it must be remembered that these figures are now more than two years old, and many changes undoubtedly would be revealed were it possible to secure a similar report for 1911.

In the accompanying tabulation is presented the statistics for the entire state, and for the cities of Buffalo and New York. Automobiles are manufactured in several other cities, but the amount of business transacted does not appear to have warranted segregation in the report of the census board, and the figures are included in the item "All other industries." The compilation will be of interest to motorists, not only because it shows the growth of the motor car industry in New York, but as an indication of the growing importance of the manufacture of cars throughout the entire country. The tabulation follows:

State of New York.

	1899	1904	1909
No. of establishments	15	35	113
Persons engaged	..	2,101	11,610
Proprietors	..	21	59
Salaried employees	56	231	1,690
Wage earners	288	1,849	9,861
Primary horsepower	..	1,254	9,398
Capital involved	$639,000	$3,347,000	$25,102,000
Salaries paid	57,000	231,000	1,604,000
Wages paid	166,000	1,227,000	7,016,000
Cost of materials	173,000	1,907,000	14,908,000
Value of products	456,000	4,260,000	30,980,000
Value added by manufact'e	283,000	2,353,000	16,072,000

City of Buffalo.

	1899	1904	1909
No. of establishments	3	5	23
Persons engaged	..	679	3,640
Proprietors	..	1	13
Salaried employees	7	53	583
Wage earners	23	625	3,044
Primary horsepower	..	...	4,561
Capital involved	$112,000	$791,000	$9,300,000
Salaries paid	6,000	71,000	283,000
Wages paid	15,000	390,000	2,200,000
Cost of materials	34,000	580,000	4,596,000
Value of products	78,000	1,386,000	9,598,000
Value added by manufact'e	44,000	806,000	5,002,000

City of New York.

	1899	1904	1909
No. of establishments	3	14	56
Persons engaged	..	631	2,326
Proprietors	..	8	31
Salaried employees	..	70	316
Wage earners	7	563	1,979
Primary horsepower	..	...	1,460
Capital involved	$89,000	$1,422,000	$3,713,000
Salaries paid	.....	80,000	492,000
Wages paid	4,000	493,000	1,585,000
Cost of materials	3,000	757,000	2,636,000
Value of products	9,000	1,399,000	6,194,000
Value added by manufact'e	6,000	642,000	3,558,000

MORRIS GRABOWSKY RESIGNS.

According to a dispatch from Detroit, Morris Grabowsky of the Alden Sampson Company, which is a constituent of the United States Motor Company, has resigned, the resignation taking effect May 1. Mr. Grabowsky had been with the Sampson since the factory was purchased by the selling company, and previously had been identified with the Rapid Motor Vehicle Company, Pontiac, Mich. He has not made known his plans for the future.

Trade Information Exchange

BUSINESS PROPOSITIONS.

State or Community Representation Is Desired by Manufacturers of Pleasure Cars, Service Wagons, Accessories and Supplies. All of Them Have Opportunities for Live Men Who Seek Advantageous Connections. These Are Well Known and Well Advertised Lines.

In Making Reply to These Propositions Address the Number of the Proposal Only. The Inquiry Will Be Forwarded to the Manufacturer Under That Number and the Reply to the Exchange Will Be Sent to the Inquirer.

761—Territorial agencies open for the sale of a car with a standard chassis, equipped with either touring or runabout bodies, marketed with complete high grade equipment. Price for runabout $1800 f. o. b. at the factory. The cars are guaranteed by the maker as high grade in every detail.

812—Territorial agencies open for sale of a car with two chassis types, the two and four-passenger tourabouts and five and seven-passenger bodies, the second with seven-passenger body; 40 horsepower motors. Cars sold with full equipment. Prices range from $3000 to $4000 f. o. b. at the factory.

793—Agencies open in the Central and Western states for a line of high grade automobile pleasure cars, trucks, municipal service and fire department apparatus, widely known and well advertised, made by one of the best established manufacturers in the industry. Every class of vehicle required for recreation or business purposes is produced and the maker is prepared to afford a character of factory attention that is essential to continued and economical service. The line is very extensive and is especially attractive.

822—Agencies open in especially desirable territory for a line of cars built with two types of chassis, 35 and 40 horsepower, two five and two four-passenger bodies, and roadster. These are sold with excellent equipment throughout, the prices ranging from $1400 to $1700 f. o. b. at the factory. This line is produced by an old and thoroughly reliable firm and is well known.

788—Agents are wanted by a firm manufacturing a standard chassis that is sold with five-passenger touring body for $2000 and for $1850 with a runabout body. The four-cylinder motor is rated at 36 horsepower. The chassis is admirably designed and the equipment is high class in every detail. The body designs are decidedly attractive.

804—Large manufacturer, producing two types of chassis has interesting proposition to those desiring to secure agency for a popular-priced car. One size of chassis is equipped with 26 horsepower (S. A. E. rating) motor, and with two types of runabout and two types of five-passenger bodies; the other chassis is sold with a five-passenger body only. Prices range from $1150 to $1500 f. o. b. at the factory. The cars are all thoroughly equipped.

811—Manufacturer building one of the best known cars in the market is open for proposals from those interested in an agency for a standard machine. One type of chassis is made and this is fitted with roadster, four, five or seven-passenger touring, or limousine or coupe bodies. This line is exceedingly well known and is well advertised. Prices range from $2500 to $2750 for the open bodies, f. o. b. at the factory.

821—A concern building three sizes of power wagon, two tons, 3.5 tons and five tons capacity, desires to establish a number of agents. Built of high class material, to sound engineering principles, with designs thoroughly tested, with a motor of unusual capacity, and with equipment including self-starter, electric lights, and every desirable accessory, these vehicles are especially attractive. The prices range from $2750 to $4400.

772—A desirable connection may be made by a number of agents for a line that includes both electric and gasoline delivery wagons and trucks. The machines are built by a concern of undoubted reliability, with large resources, and the guarantee to the purchasers is very broad. The factory attention given by this company is such as to justify careful inquiry. The range of prices is extremely wide, vehicles being produced for every requirement.

798—Agencies can be established for a high grade service wagon of a ton capacity. But one chassis size is produced. The design is in every way mechanical and the construction and material are unusually substantial. The machine has self-starting equipment. This is an opportunity of distinct merit.

806—The maker of a standard delivery wagon with capacity of 1500 pounds, with open body as standard equipment, selling for $875 f. o. b. at the factory, wishes to establish agents throughout the country. The machines are well constructed, of high grade material, have all desirable equipment, and are sold with a broad guarantee. This is a line that should interest all desiring to secure a popular priced and reliable machine.

779—Agents generally are required by a well established firm producing a 3000-pound capacity delivery wagon that is high grade in every respect. This vehicle has an unusually large number of exclusive features that insure economy of time and attention and make for long endurance. The price for the chassis ranges from $2200 to $2500 f. o. b. at the factory.

799—Energetic agents are desired by a firm producing seven different types of delivery wagons and trucks, these ranging in capacity from 800 pounds to three tons, and in price from $850 to $2900 f. o. b. at the factory. These machines are designed to meet the requirements of all classes of service and are economical and reliable.

918—Manufacturer of two types of delivery wagon, one of 1000 pounds and the other of 1500 pounds capacity, the first with enclosed and the latter with open body, will make attractive contract with live wire representatives. Some excellent New England territory is available. These machines sell for $1000 and $1050 f. o. b. at the factory.

782—New England agent for a manufacturer of high grade moderate priced pleasure cars is desirous of establishing a number of sub-agencies in the section that he controls. He has an especially attractive proposition to make and can give to men who mean business unusual opportunities.

814—The manufacturer of a well known and widely advertised line of automobile oils and greases has an agency contract proposition that is exceedingly liberal to offer to those who want to connect themselves with a reliable and dependable firm. The oils and greases are of grades to meet every requirement and are produced from the highest class crudes by scientific refining.

816—A spark plug manufacturer, producing plugs that have exclusive and desirable qualities, wishes to establish a number of first class agencies. A liberal contract is offered and territorial rights will be given to those who will demonstrate their ability to do business.

819—Agents who desire to secure the selling rights for a spark plug that is high grade in every respect, having construction that insures long service and endurance, can make advantageous connection for both local and state rights. The contract is exceedingly liberal.

794—A well established concern that has the agency for two of the most prosperous industrial states in the East for a line of gasoline and electric service vehicles, produced in sizes and types to meet every possible requirement for transportation, desires to extend its activities to take full advantage of its opportunities. Those who wish to make investment in a business that has unlimited possibilities will find this an opening of unusual promise. It is an especially desirable opportunity for a business man.

801—Company manufacturing high grade pleasure car and service wagon wheels, in New York State, having excess factory space and facilities, will consider proposition to combine with a concern manufacturing automobile parts or completed vehicles. The plant is new, equipped with the latest machinery and ample power, has abundant water from artesian wells and good fire protection. Has four-acre site and a frontage of 856 feet on railroad. The location is a rapidly growing city with the best of freight and express shipment facilities. The proposition is offered with a view to increasing the capital and business of the company. It is open to the closest investigation.

TRUCK SERVICE IN THE PUBLIC GARAGE.

Systematic Attention to Machines Whose Owners Cannot with Economy Maintain Their Own Stations by Methods That Insure Proper Care and Constant Use at a Cost in Every Way Reasonable.

THE business man who maintains his own delivery equipment meets with a serious problem when he considers changing from animal to motor wagons. Experience has demonstrated that it is economical to stable the horses and provide attention as compares with the service of public stables. It is assumed that the ratio of economy increases with the number of animals used. Having knowledge of stabling and care and maintenance expense the inquirer often accepts sometimes without question, a continuation of this system as being imperative to realize the fullest value of the power vehicles. Having experience as owner of a pleasure car and not differentiating clearly that this machine has been used with more or less indifference to expense, and basing conclusions upon suppositions and insufficient information, the prospective purchaser frequently decides that he ought to be independent of all public service to obtain the most practical results.

DAY REPORT—TRUCK SERVICE.

	Out......	In......	Out......	In......	Odometer reading......	Gasoline, gals.	Oil, qts......	Grease, lbs....
Truck No. 5....	6.55	11.40	12.35	5.20	1728.6	15	3	5
Truck No. 2....	7.04	12.15	1.10	6.05	3308.2	10	2	.
Truck No. 9....	7.12	11.55	1.02	5.50	4117.5	10	.	.
Truck No. 7....	7.21	....	....	6.10	2738.3	10	3	3
Truck No. 1....	7.27	12.07	1.05	5.38	1561.9	8	1	.
Truck No. 3....	7.32	....	....	7.14	5126.0	12	2	.
Truck No. 4....	7.36	11.48	12.50	5.41	3811.4	18	4	2
Truck No. 6....	7.41	....	....	6.17	2812.8	10	.	.
Truck No. 8....	7.44	....	....	6.29	4614.1	15	2	4

Form 1, Sufficient Length for Entry of Record of Each Truck Daily—Sent to Office by Foreman.

With the single animal or the team as a unit a delivery may have been developed, but what may appear to be equipment of considerable proportions shrinks decidedly when the motor truck, for instance, takes the place of three two-horse teams. The stable that has been sufficient for 12 horses and six wagons, to illustrate, is seemingly much too large for merely sheltering two trucks. Quarter the barn floor area will suffice to house the machines, and aside from a work bench and small storage facilities nothing else is required. A gasoline storage tank is desirable, but not necessary. To continue the use of the stable as a garage appears to be a waste of money. To change to a smaller seems to be a logical conclusion.

The trucks are not regarded as experiment. They are justified as practical vehicles by the experience of others. It is necessary that they be serviceable during the day and this means that each driver must do a full day's work. Whatever care and attention is desirable ought to be given after working hours or the service of the machines lessens in value. Obviously the trucks should be systematically examined and adjustment or repair made immediately. If the drivers are capable of doing this mechanical work they cannot be expected to work extremely long hours, and if the work is to be principally at night there must be equipment that would not be required were it possible to command the outside facilities available during working hours of the day.

Regarding the condition practically it is realized that there may be many nights, when the care needed should be nothing more than washing, polishing, replenishing the fuel, lubricant and water supplies, oiling and turning the grease cups, filling the lamps and cleaning the engine. Aside from the washing and polishing not more than an hour should be required, and often less time. This attention must be given, however. There will be other occasions when the work may require hours, and sometimes more than one man, because the trucks must be ready for use if it is possible to have them serviceable. Accidents cannot be foretold, but they must be expected and provision should be made to cope with any situation that can reasonably be anticipated.

Obviously it is not economy to have a regular employee capable of doing the high class work essential to insure satisfactory operation of the trucks. He would not have enough to do to keep him occupied. If this service could be combined with another or others to warrant the employment of a skilled man that is another condition. Generally such combination is not possible and the average or usual situation to be met with is regarded. To hire a man for the work stated is an insurance, but it is not economy. To pay a man for the actual labor required would mean paying well for it, because a dependable mechanic could not be expected to devote himself to such employment unless his price were paid.

Then the condition is, that the man whose delivery service is such that he can not afford a well equipped private garage to maintain it must either sacrifice some of the economy he seeks until it has increased to such proportion as will warrant every facility, a development that must necessarily be slow and dependent to a considerable extent upon the satisfaction he gives to his patrons.

TROUBLE REPORT.

Date ....

Truck No. 4—
    Loose service brake
    Carburetor flooding
Truck No. 7—
    Leaking gasoline tank
Truck No. 9—
    Knock in motor

Form 2, of Size to Meet Requirements—Sent to Office by Foreman.

The alternative is to turn to the public service stations, which are generally devoted to pleasure vehicles, and with these the methods usually the vogue are not conducive to the character of service a business man must have. There are stations where admirable attention is given, but what is stated applies generally and not specifically to all. Under ordinary circumstances the mechanical force is employed during the day, and night work is an accommodation. Overtime must be paid for at regular rates. The night workers are cleaners as a rule and few stations pretend to afford the same character of service day and night. In such stations, too, the drivers do not have access to the machine and tool facilities and the stock, for these are never left accessible to those not responsible. The lock and key are surprising preventions of leakage and loss.

SUGGESTIONS TO OWNER.

Date ....

O'Neill & Mulligan
Truck No. 5—
Brakes relined (necessary)
Cylinders cleaned
Valves ground
Repair left rear tire (necessary)
Probable time required

Form 3, Small Sheet, Padded, in Two Colors of Paper—Original Sent to Owner and Copy to Office for Record.

Contrasting the private and the public garage the rental of the one must be as against the price paid for storage. The washing, polishing, protection and the working facilities for the driver in the station are included in the cost, and the last mentioned offsets the expense for some equipment. The difference in cost of gasoline, oil, grease, waste, and similar supplies eventually eats up the initial cost of a storage tank and fittings. There must be a profit for the station, but the real concern with the truck owner is not that profit, but his own, to insure which he must keep his machines as continuously in operation as is possible.

The rapidly increasing utilization of the motor wagon has brought the business man to require of the public garage a character and quality of service not previously demanded, and the garage manager faces a problem that is quite as perplexing as that the truck owner is contemplating. It is apparent that this condition must be met and that it must be purely on a basis of business merit. No other factors are worthy of attention. The principal business of many garages will eventually be with service wagons and this being so the earlier this foundation is reached the better. It is possible for the garage to afford to owners of wagons who desire service a better attention than they could secure in their own stations, and at a cost that is sufficiently economical to satisfy them under all conditions.

The example of service is that given by the Central Garage, Pawtucket, R. I., conducted by Fred H. L. James. Mr. James is a draftsman by profession who advanced to the management of a large and extremely high class machine works, and has an experience that has been especially valuable to him. His health required him to abandon work for several years and he engaged in his present business because it was convenient to his home and permitted him to be out of doors the greater part of his time.

Mr. James' knowledge of business methods and men was such that he met conditions as they arose with entire success, and he has developed in connection with his garage a service that is in every way practical, economical to his patrons and sufficiently profitable to justify this class of custom quite as much as any other. For the benefit of those who may seek to profit by the suggestions of this article it should be stated that the prices charged at the garage are average. When Mr. James took over the business there were numerous losses and leaks that were sought and remedied. This was a condition that might obtain with any man. Eventually a system was adopted that has proven extremely satisfactory in every respect. Emphasis is made of system because suggestions are made that may be employed to good advantage in following the general idea of a service for motor wagons, and it is imperative with any business to have record of every transaction in the simplest and most practical form. It should be said that these are not the forms used by the Central Garage, but are what appears to be desirable with any volume of business of this nature.

It may be well to state that at times the combination service causes conditions that are unavoidable where the two classes of vehicles are in storage, particularly Sundays when rain falls and it is necessary to work on the trucks, for they take up much floor space and with cars constantly going and returning there is necessarily congestion. It is not possible to interfere with the work on the trucks and it cannot be slighted, so that to obtain the most practical results a systematic arrangement of the cars in the garage is first of all to be decided on. Other days the trucks are worked during business hours and it is seldom that more than one at a time is receiving attention, so that space is not so greatly needed.

The service referred to was started with a single truck and it has been so well conducted that now five firms having one and two trucks avail themselves of it rather than establish their own garages. The prospects are that this will be largely developed the present season. It is probable that this will lead to a separate station, wholly for the trucks and wagons.

The attention given is of two classes. The one is a standing order for such work as is necessary to maintain the trucks in a thoroughly serviceable condition. The other is where work is authorized by the firms upon notification of conditions. The expectation is that the machines will be ready for work each morning and this requirement must be met. In several instances this has meant work the entire night for some of the men, but in only two instances has there been failure; once when an engine case was damaged beyond any form of repair save welding, and another time when a shaft was not delivered as ordered. Taking four years' service this is a thoroughly businesslike showing.

The service first covers storage during the time the trucks are not in use, daily washing and polishing, oiling and tightening the grease cups, filling and cleaning the lamps, cleaning the engine, and replenishing the fuel, water and lubricant. The care is for a regular monthly charge. The supplies are charged in the quantities used. The most important thing is the attention to the mechanical condition of the trucks.

AUTHORIZED REPAIRS—SPECIAL WORK.

Date ....

.... Truck No. ....
Owner Hubbard & Hotchkiss
1 Weld crankcase
2 New high speed transmission gear
3 Repair radiator.

1 Sent to J. F. Ellis Company, Rochester, N. Y.
2 Gear blank forged in shop, cut by Willis & Baker
3 Sent to maker, Fedders Company, Buffalo, N. Y.

Form 4, Small Sheet, Padded, in Two Colors of Paper—Original Sent to Owner and Copy to Office.

The foundation of this is the reports made by the drivers, who are required to report to the foreman or the office any trouble experienced or condition noted during the work of the day. When the trucks are driven into the garage the engines are operated within the hearing and observation of the foreman or Mr. James, and usually any derangement or fault may be detected. If there are in the reports any evidences of needs of adjustments, breakages, or damage or wear, these are inquired into immediately and necessary work is begun at once.

WEEKLY INSPECTION.

Date ....

	Adjusting	Repairs	Parts	Supplies	Total Mileage
Engine—					
Compression					
Valve timing..........					
Cylinder condition.....					
Ignition—					
Magneto circuit........					
Battery circuit.........					
Spark plugs............					
Cables					
Battery voltage........					
Cooling—					
Radiator					
Fan					
Pump					
Lubrication—					
Pump					
Sight feed.............					
Piping system..........					
Level and drain cocks..					
Reservoir					
Clutch—					
Engagement					
Slipping					
Condition					
Transmission—					
Gears					
Bearings					
Hand lever.............					
Condition					
Brakes—					
Hand lever.............					
Foot pedal.............					
Driving System—					
Shaft					
Universal joints........					
Jackshaft					
Differential					
Sprockets					
Chains					
Radius rods............					
Wheels and Axles—					
Rear axle..............					
Bearings					
Brake drums............					
Tires					
Condition					
Front axle.............					
Spindles					
Pivots					
Yokes					
Tires					
Condition					
Steering Gear—					
Post and connections...					
Draglink					
Tiebar					
Condition					
Springs—					
Clips					
Saddles					
Shackles					
Grease Cups...............					
Oil Caps..................					
Hub Caps..................					
Lamps					
Gasoline Tank.............					
Oil Tank..................					
Tested Before Adjusting..					
Tested After Adjusting....					
Tested Before Repair......					
Tested After Repair.......					

Form 5, Ruled to Be Filled In by a Note in the Appropriate Column for Each Item Stated, and Signed by Those Doing the Work and Testing—Original to Owner and Copy to Office.

Experience has proven that it is well to take all the time available, because of possibilities of other developments, and as the mechanical force is limited no chances can be taken. Where a work can be completed it is taken care of, but in some instances a temporary repair is made until restoration of a permanent nature or replacement is practical. There are times when the tightening of a bolt or the adjustment of a part will mean the saving of many dollars and nothing needed is left undone, but as a rule the work each night is not such as to require much time. Because this care is taken daily there is but little to anticipate aside from actual breakage.

But each Sunday the trucks are systematically inspected and gone over. The engine is run to determine its condition, the radiating, ignition and lubricating systems are examined, the clutch is tested, the transmission cover is removed and the gears tried by feeling, the chains are loosened and the jackshaft, its bearings and differential are operated by hand to detect lost motion or wear, the brakes are operated and the connections gone over. Next the wheels are jacked and the condition of the bearings learned by testing with a pinch bar, and the steering gear and the lever arm, tiebar, knuckles and pivots are examined carefully. The radius rods and chains are looked over and the springs are seen to. The work is thorough and the men tighten every bolt that is slack, make such adjustments as are needed, and test the trucks on a short but steep hill. The workmen are expert in the inspections and the trucks are left ready for the work of the week to come. The charge for work is for the labor, plus the cost of any parts or material used.

It is a rule that no work shall be regarded as completed unless it has been tested, and nothing is taken for granted. This means that when the trucks are worked on at night they are tried out so that they will be in condition to use when the drivers call for them in the morning. The result of this service is that the trucks are always available and there is practically no time lost except when withdrawn for painting or

MONTHLY REPORT.

Date ....

...... Truck. No. ....

Owner, Hubbard & Hotchkiss

Hours of service (Out of Garage)

Mileage, odometer reading .... to ....

Gasoline (total gallons supplied)

Lubricants—
- Oil, (cylinder) gallons
- Grease, (gear and transmission) pounds

Supplies—
- Spark plugs
- Cable
- Gaskets
- Bolts and nuts
- Brake lining

Parts—
- Mudguard bracket
- Eight valve springs
- Fan belt

Labor—
- .... Repairing mudguard
- .... Adjusting ignition system
- .... Timing valves
- .... Replacing fan belt
- .... Adjusting brakes and relining shoes

Condition—
....
....
....
....

Suggestions—
....
....

Form 6, Signed by Garage Manager in Duplicate, Original to Owner, Copy to Office.

perhaps an overhaul. The real economy is in having them always serviceable.

The garage equipment must be equal to all demands made upon it. This does not mean unprofitable machine tools, but in special fittings that will make possible work out of the ordinary requirements. There should be at least one first class lathe with the regular and the special gears that will be useful in milling, for instance, thread cutting, and the like; a drill press is very useful, and other tools may be utilized to good advantage. A power air compressor is absolutely needed for the forge and brazing outfit. There should be a complete forge and the tools for working it, and the hand tools should be such that there will be enough for every worker. The stock of material should include bar nickel steel for shafts, steel tube for axle housings, bar steel to five inches diameter for gear blanks, as well as the usual rod, bar and sheet metal necessary in repair work.

The workmen should be the best that can be secured and one of them ought to be a first class blacksmith, capable of doing any work. One of the faults with most garages is that they have the forges and no men who can do the work required. To illustrate, in the event of a gear being needed and the maker a long distance away it is possible to forge a steel blank and have it cut outside, for few stations have milling or gear cutting machines. A broken front axle may be plated and brazed for a temporary or even a permanent repair, and fractured rods and parts welded or hand forged. A good blacksmith can fit the work he is making and minimize the other labor upon it. The better the machine men understand the value of their tools the more satisfactory the results. A broken axle shaft can be replaced, even to milling the square ends and cutting the threads, on an ordinary lathe. No end of work can be accomplished with the lathe, which is the most useful of tools.

The resourcefulness of the garage manager is a large asset in business. To meet an emergency and deliver the trucks on time is what brings him patronage and retains his customers. Only in the event of impossibilities should he fail, and then he must give sufficient notification to the firms dependent upon him to permit arrangements to be made for the delivery to continue. A broken engine case of aluminum cannot be welded with ordinary garage facilities and a repair is not even guaranteed by those who specialize repairing. It must be sent to the specialist or the maker or replaced. Such an accident means unavoidable delay provided the engine cannot be replaced by another.

Where the truck is built a long distance from the owner it is well for the buyer to have on hand such parts as might be needed at any time. If there is an agent within a reasonable distance he may be depended upon for replacements, but there may be some delay in securing them in the event of emergency. If the maker has a branch, or if the factory is near at hand the need of parts need not be apprehended. The garage, however, cannot be expected to carry parts unless it is agent. In considering service it is well to understand the possibilities in the event of necessary restoration and to make the provision that appears wise to do. This is a matter that the owner, and not the service station manager, has to deal with.

For the benefit of those who might desire to adapt their service to trucks a series of forms has been prepared which are practically self-explanatory. The first is the day report, which conforms to law in many states as to the registration of vehicles leaving and entering a garage, together with the odometer reading, the quantity of gasoline, oil and grease supplied for replenishment. The second is the report of the foreman which notes the conditions reported by the drivers.

The third is a statement of necessary and desirable repairs to be sent to the owners as official notification, this establishing a responsibility for any condition that might arise for failure to authorize the work needed. The fourth is the statement of outside work sent away, to establish any cause for delay or failure when returned, and that the charges were legitimate. The fifth is a weekly inspection and work record, which indicates that all parts of the machine received attention and that adjustment, repair or replacement was made, with the time for the work, together with such supplies as were necessary and a reading of the odometer to show the work of the truck during the week. The sixth is a monthly report to accompany the bill, which gives the hours of service for the month, the mileage, the fuel, oil and grease used, the supplies furnished, the parts required, the charges for labor other than regular attention, with a summary of the condition of the truck and suggestions as to work needed or desirable.

It will be understood that the value of the weekly report is to show that the truck was systematically examined and the proper care given. The monthly report details the cost of operation aside from the service charge, which, with the other detail available, gives the owner an accurate account of the expense of operation. As it is for the interest of the station to keep the expense within reasonable limits, and as the owner desires economy, the reports are equally valuable.

REMOVING SHACKLE BOLTS.

Sometimes, when dismantling the chassis the shackle bolts refuse to yield to the usual methods. Where they prove stubborn the operation will be facilitated by jacking up the spring to relieve the tension. The bolt then should be turned with a wrench, while being driven out. These parts are subject to wear, and when shoulders are formed, should be replaced with new ones. It is these ridges that cause the trouble.

ADJUSTING TENSION RODS.

It is attention to the little details of the car that pleases the owner and creates a satisfied customer. A few minutes spent looking over the chassis for loose nuts, bolts, etc., is time well expended. Among the parts which should receive attention occasionally is the tension rod of the rear axle. When this member becomes loose it usually will be found that one of the nuts at either end is at fault and it may be possible that the rod itself is spoiled.

The object of the device is to keep the rear axle from sagging and a majority require this support. The rear system could be such as to omit the member but this would mean extremely heavy construction. A design employing the rod is more nearly correct scientifically than without, as it can be made lighter and equally as strong.

The best method of adjusting these is to jack up the wheels so that the weight is nearly off the tires. The adjusting nuts are then screwed up, not too hard, but just snug, for if the tension be greater than this it puts a needless strain upon the axle, and not only sets up internal friction, but may result in the rod breaking again before long.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from March Issue.)

Wiring of Bosch Dual System.

The connections of the Bosch dual system are shown at Fig. 26, the coil being displayed both in elevation and end views to show the terminal block. The grounding terminal of the magneto is run to the grounding terminal of the switch and when the ignition is switched off or when the engine is utilizing battery current terminal 2 is grounded. With the switch thrown to battery position the flow of current is from the positive terminal 7 of the chemical current producer to the ground, thence by the battery timer lever to the battery connection on the magneto, to switch terminal 1, through the primary winding of the induction coil to 5 and thence back to battery.

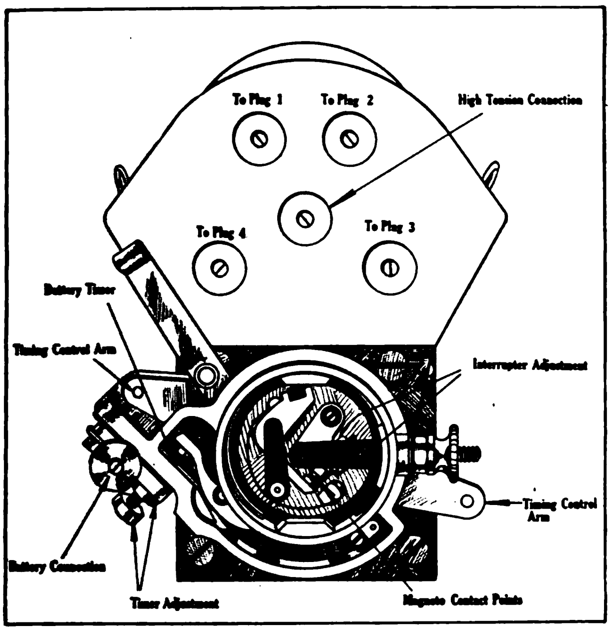


Fig. 25—Bosch DU4 Dual Magneto Contact Breaker Arrangement.

The secondary terminal of the magneto is coupled to switch terminal 3 and the high-tension distributor connection 4 is attached to contact 4 of the terminal block. When the switch is thrown to the magneto position the high-tension current produced in the magneto armature winding flows by wire 3 to switch and back by wire 4 to the distributor, by which it is delivered to the plugs. When operating on the battery the magneto is grounded and there is no production of secondary current. The switch is in such position, however, that the secondary current from the transformer coil is supplied the distributor.

The dual system permits one to operate the engine on either battery or magneto, either furnishing satisfactory ignition, this being done by making the battery and magneto systems distinct electrically, though they are combined for the main part in the magneto. This is not required by all motor car manufacturers, and the duplex system has been devised to provide a battery for self-starting or starting readily at very low cranking speeds, at the same time permitting running of the engine mainly on the magneto. The word "duplex" was selected as a title for this system because two distinct currents make simultaneous use of the same circuit.

The duplex magneto differs from the standard DU4 type in the provision of two binding posts on the cover of the interrupter housing. In the illustration, Fig. 27, it will be seen that two metal segments are placed on the inside surface of this cover, one being connected to each binding post. The method of wiring requires the positive terminal of the battery to be coupled to one of these binding posts and the negative to the other.

To understand the action of this commutator, we will take the instant when the carbon brush "B" is in contact with the segment to which the positive terminal of the battery is connected and it will be seen that the battery current flows to the carbon brush "B," through the interrupter points and back through carbon brush "A" to the negative of the battery. When the interrupter is closed it forms a path across the segments and the breaking of this short circuit by the opening of the interrupter points results in the production of extra current in the primary coil. The direction in which the extra current will flow will be the same as that of the magneto current and it will supplement and intensify it. A half revolution later, the other segment will be in contact with carbon brush "B" and the conditions will be such that the flow of battery current will be reversed to coincide with the reversal of magneto energy. With the battery properly connected every alternation of magneto current is accompanied by a reversal of the battery circuit. The wiring diagram Fig. 28 clearly shows the arrangement of parts. The coil is provided with a button, which is depressed to start the engine without cranking. One of the peculiarities of the duplex system is that the battery and magneto are connected in parallel and not in series, as obtains with the usual transformer coil system.

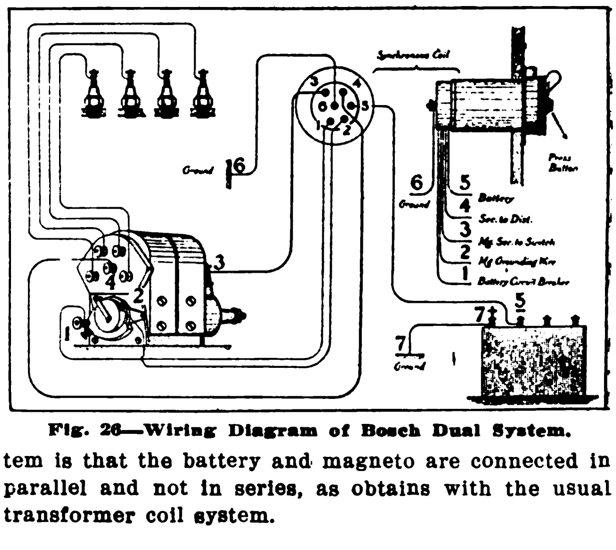


Fig. 26—Wiring Diagram of Bosch Dual System.

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

It should be understood that the use of the interrupter to make and break the battery circuit does not in the least interfere with its function of opening and closing the magneto circuit as the two are practically distinct with the exception of the interrupter points. When these are together the low-tension magneto current can flow freely in one circuit and the battery energy flows with equal freedom in the other.

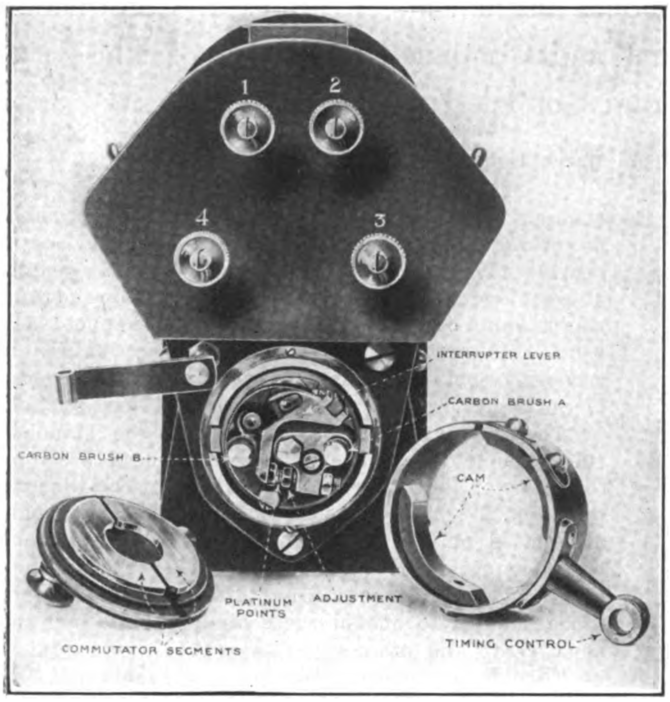


Fig. 27—Bosch DU4 Duplex Magneto, Showing Contact Breaker Construction.

The extra current produced in the primary coil by the separation of the contact points discharges through the primary winding of the armature and its action is to supplement the current already existing there. The final effect is to build up the magneto current by the addition of that derived from the battery and the spark produced in the secondary circuit will have more than ordinary intensity. By utilizing the secondary winding of the magneto in this manner, and obtaining a strong current from an external source, one will obtain a hot high-tension spark at the lowest speed at which the engine may be cranked. The reason for this is that one is not dependent upon the current produced in the magneto armature, which is of less strength when the shaft is revolved slowly, as the electrical energy is produced from an outside source.

In addition to the systems already enumerated, the Bosch magneto of the independent type may be used in connection with a double system; that is, by the addition of a timer and distributor for the battery current and a transformer coil of the vibrator type, one can fit two separate sets of plugs, one to work directly from the magneto distributor, the other supplied by the synchronous coil through the secondary distributor driven from the engine.

The vibrator is only used for starting on the spark, the battery circuit breaker being of the quick contact type, producing a single impulse in the primary of the coil, and a corresponding single spark at the plugs for normal running. For starting on the switch, however, the starting button is depressed, the vibrator causes a constant stream of sparks to flow between the plug points as long as the depression continues and the distributor brush of the secondary timer is in contact with one of the segments leading to a spark plug. If there is any gas in the cylinders, it will be exploded and the engine will take up its cycle of operations without preliminary hand cranking. The wiring diagram of such a system is clearly shown at Fig. 29.

Features of Unconventional Mea Magneto.

The Mea magneto is a distinctive type recently introduced in this country and while it operates on the magneto-electric induction principle, it differs very much in form from the conventional types considered. As will be evident from Fig. 30, which gives a longitudinal section and end elevation, with all principal parts outlined, the magnets are radically different from the usual horseshoe type used in instruments of this character to produce the magnetic field. The magnets are in the shape of a bell and the armature is mounted between the pole pieces in such manner that its axis of rotation coincides with the central longitudinal axis of the compound bell shaped field magnet encircling the armature.

With the horseshoe types of magnetos, the timing of the ignition is effected by breaking the circuit between the contact points earlier or later relative to the direction of armature rotation, and the magnets remain stationary. With a retarded spark lever placing the circuit is not broken at the time of maximum current strength in the armature and consequently, the spark is weak unless the spark lever is advanced, so that the break between the points will occur simultaneous with the position of the armature that coincides with the greatest current strength.

It is claimed that the construction of the Mea magneto allows one to obtain as hot a spark on the fully retarded position of the timing lever as in full advance. In this construction the bell shaped magnet casing is mounted on special bearings, and the ignition timing is changed by rocking the outer casing on magnets. As the magnetic field is moved to correspond to the time of breaking contact between the points, the separation takes place at all times when the armature is at the most favorable position and the spark takes place when the voltage produced in the armature is at its highest value.

The contact breaker and distributor are also novel in construction. The former is placed parallel to the primary winding outside of the magnet in a small housing, and the short circuiting and breaking of the primary current takes place between a pair of platinum screws, one being fixed to a disc, the other on an annular steel spring. The points are separated by a fibre roller at the proper time.

The distributor employs two revolving brushes instead of one, these being imbedded in a block of insulating material driven by the usual reduction gear, and as the brushes are placed 90 degrees from each

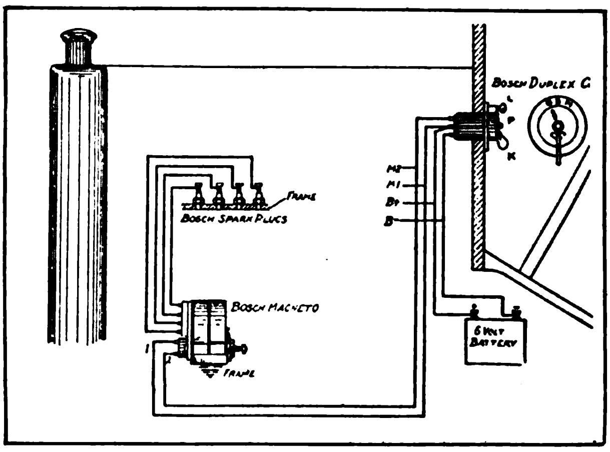


Fig. 28—Wiring Diagram of Bosch DU4 Duplex System.

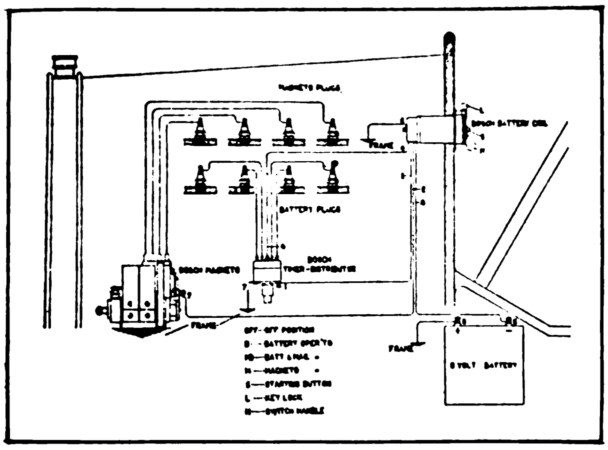

MAGNETO PLUGS
BOSCH BATTERY COIL
FRAME
BATTERY PLUGS
BOSCH MAGNETO
BOSCH TIMER-DISTRIBUTOR
FRAME
OFF—OFF POSITION
B—BATTERY OPER'TG
MB—BATT & MAG. "
M—MAGNETO "
S—STARTING BUTTON
L—KEY LOCK
H—SWITCH HANDLE
FRAME
6 VOLT BATTERY

Fig. 29—Arrangement of Parts of Bosch Double System.

other, obviously, each makes contact with two segments in the distributor housing which are connected to the spark plugs. Advanced ignition is obtained by rocking the apparatus in an opposite direction to that of armature rotation, a retarded spark is secured by oscillating the case in the same direction as the armature turns.

Volta Magneto Has Desirable Features.

The Volta magneto, shown at Fig. 31, belongs to the arc-flame type, generating the high-tension current in the armature without the aid of an external coil. The field magnets, armature, interrupter and distributor follow standard design. It has a number of desirable features, however, among which are the ability to adjust the contact points without stopping the engine, instant accessibility of the condenser and a very simple distributor arrangement.

A study of the illustration will show how the above results are accomplished. The most noticeable feature is the location of the condenser. Instead of being mounted on the armature shaft behind the interrupter, it is separately contained in a water tight box, held by one screw and a pin where it may be withdrawn in a moment and replaced by a new one, should that be necessary. The cover plate over the armature is permanently sealed, and the armature is therefore enclosed water tight.

Removing the condenser from behind the interrupter, as in conventional designs, permits one to place the high-tension collector ring directly under the hard rubber distributor housing. The high-tension current therefore goes directly up by the carbon collector brushes to the distributor. The housing fits the casing beneath it so closely as to prevent water from entering.

The armature shaft runs in ball bearings of unusual size, and these bearings are separated by partitions from the rest of the mechanism. The oil cups deliver oil to the bearings, and drain outlets are provided underneath. Even that provision, however, would not be sufficient to prevent trouble from over lubrication except for the partitions mentioned.

The interrupter, which is shown with the cover plate removed, differs from some other interrupters in that the cam itself rotates while the "breaker box" as a whole remains stationary. The cam is of hardened steel and runs against a steel roller. The contact screw is stationary, and may be adjusted while the engine runs. The course of the primary current is through a central insulated wire passing through the armature shaft to the insulated button bearing against the flat spring on the insulated mounting, thence from the contact arm to the grounded contact point. One of the binding posts is connected to the condenser and the other connects with the ground switch.

The distributor differs from some others in that the hard rubber housing has no high-tension contact segments. Instead, the rotating hard rubber disc has a single T shaped inlaid brass segment receiving current from the carbon distributor brush. The cross bar of this segment travels around, making contact one at a time with as many carbon distributing brushes as there are cylinders. These brushes take the place of the usual stationary segments, and the brass segment takes the place of the usual distributing brush. The effect is to increase considerably the insulating distance from one collector brush to the next, since the brushes are much smaller than the usual segments. In this way arcing from one segment to the next is avoided.

The armature diameter of the Volta magneto is said to be somewhat larger than the others, and the secondary winding has about 600 more turns. This results in a hot spark at ordinary cranking speeds. The clearance between armature and pole pieces is as small as accurate workmanship and due allowance for expansion from heat will permit. After being completely assembled the armature is brought to final size by grinding. As the section shows, the distributor runs in ball bearings, and it will continue true

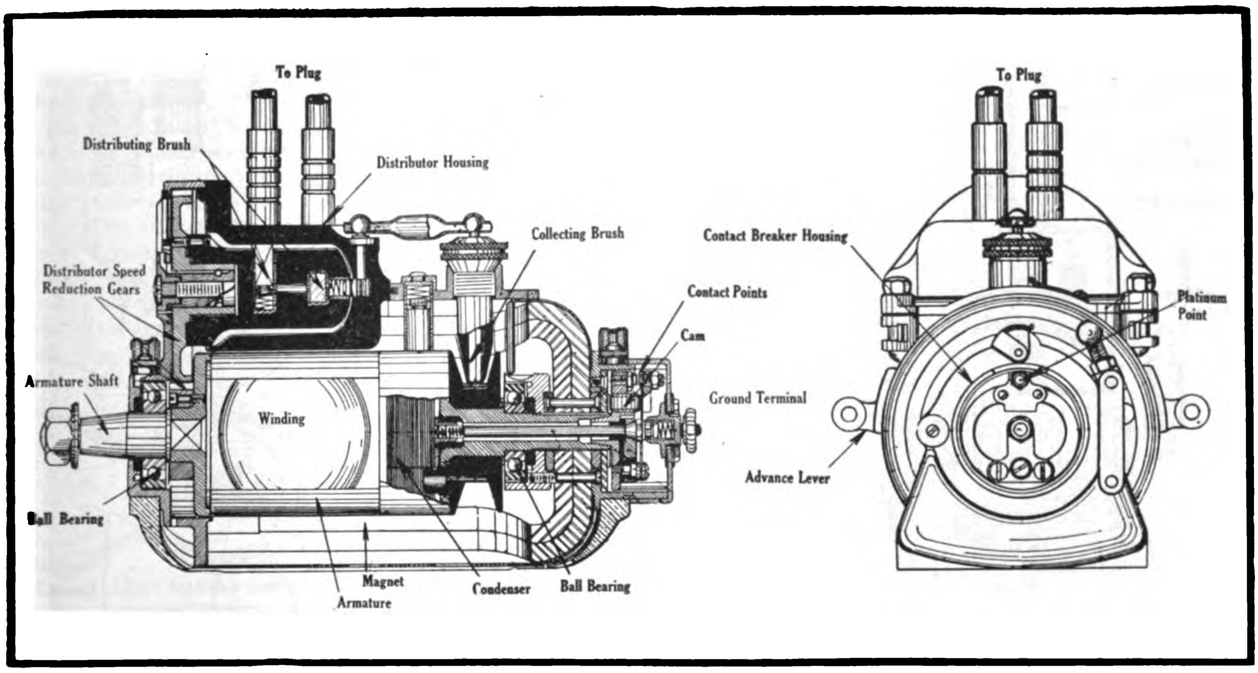

To Plug
Distributing Brush
Distributor Housing
Collecting Brush
Distributor Speed Reduction Gears
Armature Shaft
Winding
Ball Bearing
Magnet
Armature
Condenser
Ball Bearing
Contact Points
Cam
Ground Terminal
To Plug
Contact Breaker Housing
Platinum Point
Advance Lever

Fig. 30—Sectional View and End Elevation of Distinctive Mea Magneto, Which Employs Bell Shape Magnets.

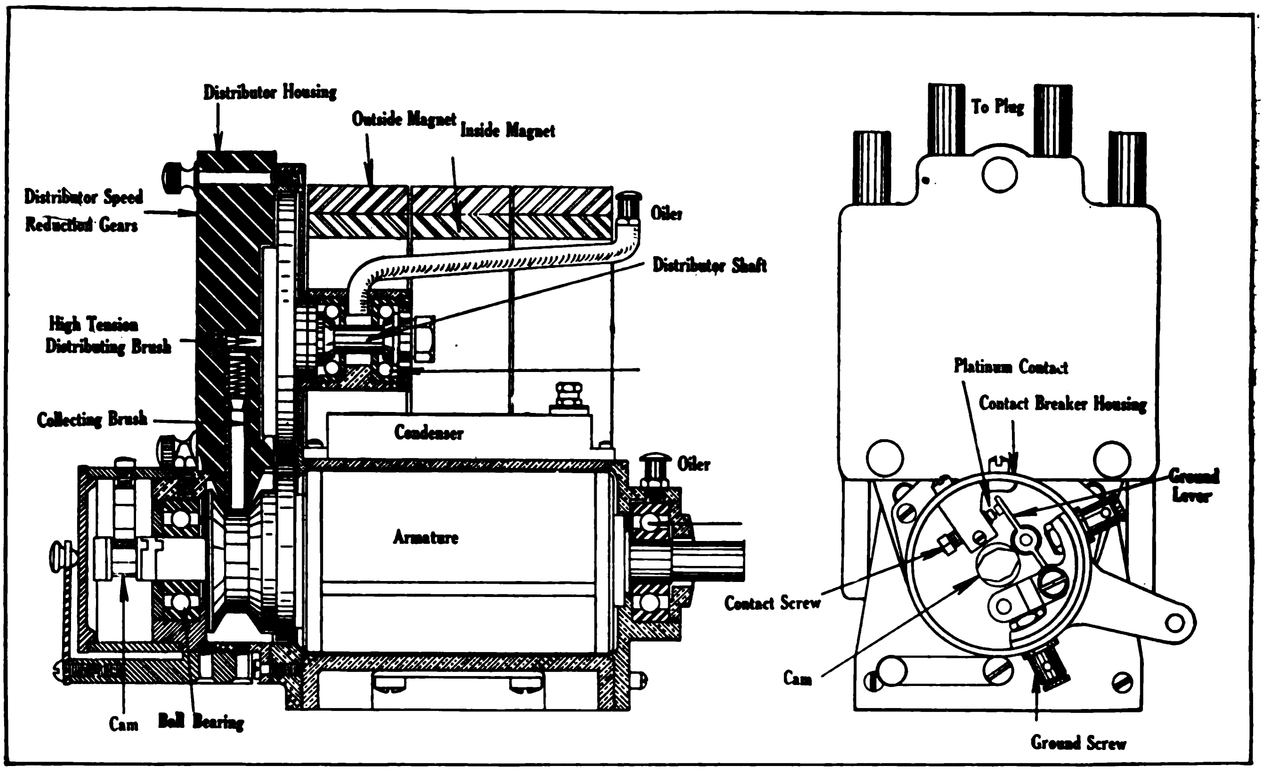

Distributor Housing
Outside Magnet
Inside Magnet
Distributor Speed Reduction Gears
Oiler
Distributor Shaft
High Tension Distributing Brush
Collecting Brush
Condenser
Oiler
Armature
Cam
Ball Bearing
To Plug
Platinum Contact
Contact Breaker Housing
Ground Lever
Contact Screw
Cam
Ground Screw

Fig. 31—Longitudinal Section and End Elevation of Volta Magneto, Showing Simplicity of Assembly.

for an almost indefinite period of operation.

Details of Eisemann High-Tension Magneto.

In common with other instruments working on the same general principles, the Eisemann direct high-tension magneto has a double wound armature, revolved in the magnetic field produced by three pairs of U magnets. As in other high-tension types the armature is revolved by outside gearing and during its rotation the low-tension current is produced in the primary winding twice in one revolution and the secondary current is induced in the finer coils simultaneously with the breaking of the primary short circuit by the separation of the contact points.

The general details of construction of the magneto and the relation of the various parts of the mechanism are clearly shown in the longitudinal section at Fig. 32, while the arrangement of the contact breaker and distributor parts is depicted in the end view on the same plate.

The make and break or interrupter mechanism moves inside the fixed cover carrying the cams and it is fastened to the armature axle by an easily removed screw, and if this fastening is extracted the entire make and break assembly can be removed. The cover carrying the cams is oscillated back and forth to alter the timing, suitable timing levers projecting on both sides. Immediately back of the contact breaker one can see the annular ball bearing employed to support the front of the armature. The distributor driving gear is placed back of the bearing, and the condenser is carried near the armature being concentric with the armature shaft and turning with it.

(To Be Continued.)

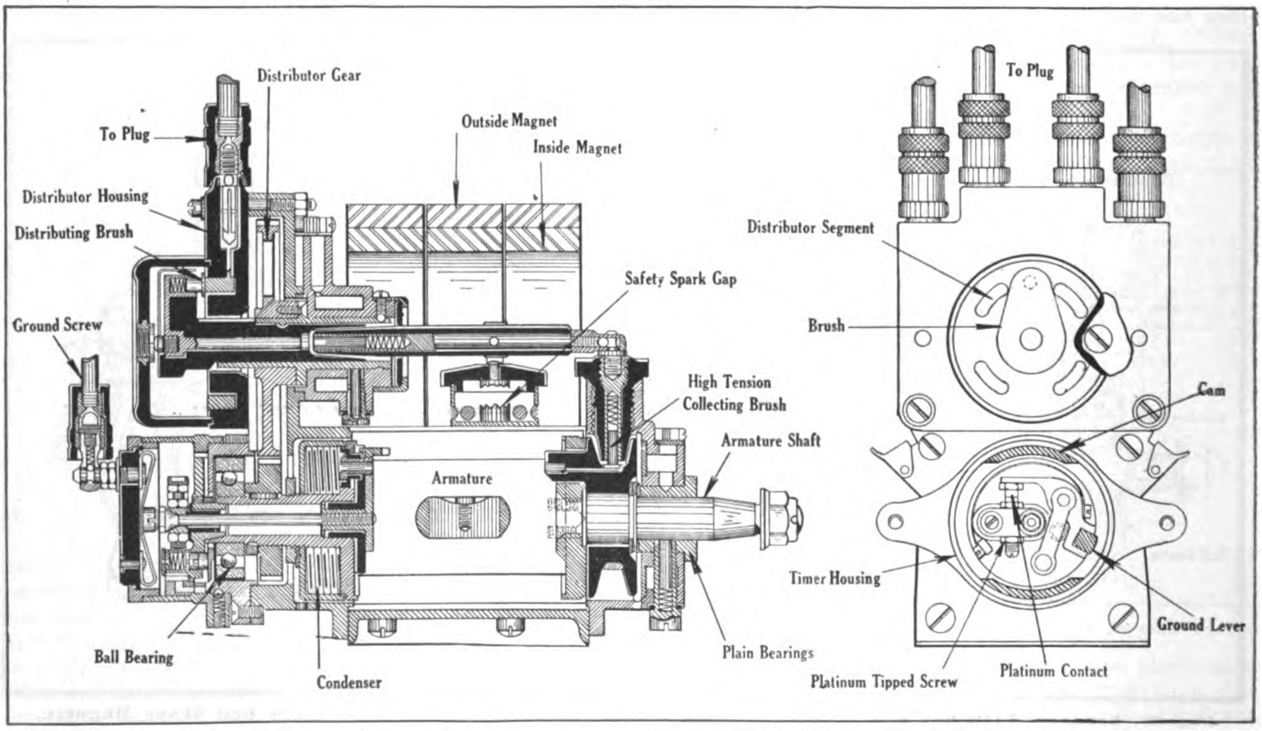
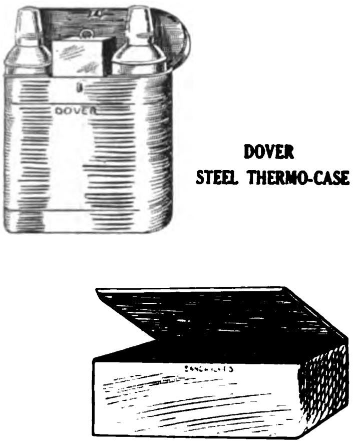

Distributor Gear
To Plug
Distributor Housing
Distributing Brush
Ground Screw
Outside Magnet
Inside Magnet
Safety Spark Gap
High Tension Collecting Brush
Armature Shaft
Armature
Ball Bearing
Condenser
Plain Bearings
To Plug
Distributor Segment
Brush
Cam
Timer Housing
Ground Lever
Platinum Tipped Screw
Platinum Contact

Fig. 32—Longitudinal Section and End Elevation of Eisemann High-Tension Magneto.

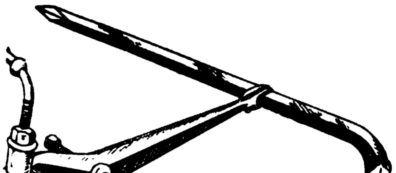
ACCESSORIES AND APPLIANCES THAT SELL.

The Dover Steel Thermos Case is a novelty manufactured and marketed by the Dover Stamping & Manufacturing Company, Cambridge, Mass. The Thermos bottle is an accessory that is appreciated by motorists as the vacuum will keep fluid hot or cold for hours and is adaptable to all temperatures. As these members are fragile and broken easily when not handled properly, they should be carried in some form of protector. The Dover case is constructed of steel and so arranged that two bottles may be carried, also a sandwich case. The interior of the container is lined with double faced corrugated heavy cardboard and forms an absolute protector against shocks. The cases are enamelled black with two narrow gold stripes and present an attractive appearance. They are inexpensive, occupy but little room and are very light.


DOVER STEEL THERMO-CASE

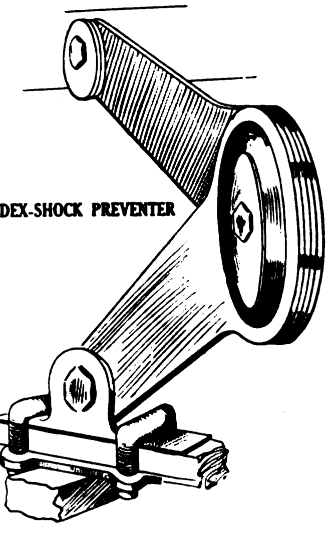
* * *

The Sager Diamond Bumper, manufactured by the J. H. Sager Company, Rochester, N. Y., is a new form brought out by this concern and its features should appeal to the discriminating motorist who desires something distinctive. The advantages of these devices are many. Drivers sometimes carelessly back into other machines before the latter may be reversed, and in shifting the positions of cars in the garage headlights are broken and considerable damage may result. The new Sager device has a diamond-shaped bar which adds to its appearance and is constructed of heavy, solid, hardened brass, reinforced with thick open hearth steel, making the tube almost indestructible. The bell cranks are of solid manganese bronze. It is attached easily and when fitted stands six inches above the spring hanger, thereby protecting lamps, radiator, fender and tires. Where an automobile is being operated in heavy traffic it is a valuable equipment.


SAGER DIAMOND BUMPER

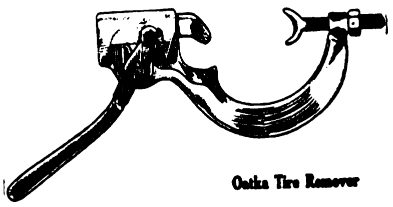
* * *

The Mondex Shock Preventer, marketed by the Aristos Company, New York City, is said to differ in principle from other devices for the purpose of softening the concussion of road shocks. Vibration causes considerable trouble and the maker of the Mondex claims it will reduce to a minimum the liability of broken springs as well as improve the riding qualities of an automobile. It is placed between the axle and frame of the car, and controls the action of the spring as it moves up or down. The principle is not friction, but a graduated compression of expanding and contracting resilient rubber discs, and it is said that the rubber cushion rapidly increases in resistance the further it is compressed, so that a heavy shock meets with much and a light one with but little. The difference between the downward motion and the upward or recoil of the spring is met by having a greater amount of rubber compression on the rising movement. This is brought about by the different grades in incline of the planes.


MONDEX-SHOCK PREVENTER

* * *

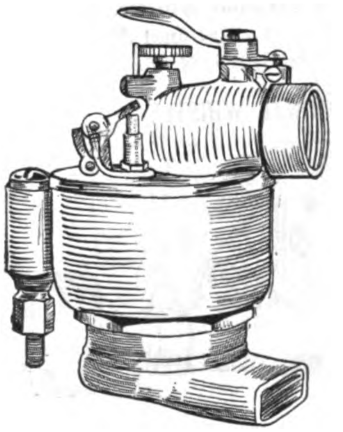
The Oatka Tire Remover is a neat, compact tool, designed for use on quick detachable rims. With it the removable flange may be forced back easily and the device locks automatically so that the lock ring may be displaced from its groove. Applied between the spokes of a wheel it may be utilized to remove the most stubborn shoe. The tool is reversible in its application and is made in two sizes. It is marketed by J. W. Grumiaux, Le Roy, N. Y.


Oatka Tire Remover

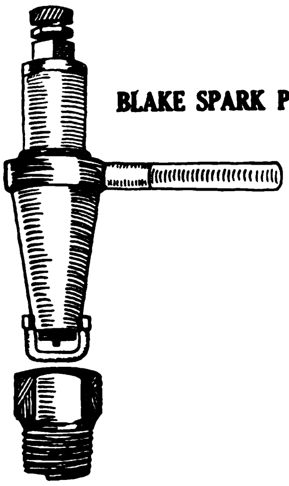
* * *

Planhard Carburetors make for simplicity, inasmuch as they are free from springs, and have but one spraying nozzle, this being located in the centre of a cup shaped member and surrounded by a constant air opening. At low and intermediate speeds air is admitted through these openings, but upon the speed of the piston increasing, its suction lifts one or more balls in a plate surrounding the fixed air passages, increasing the amount of air admitted. This plate is adjustable and is fitted with six balls. A concentric float is utilized, enclosing the upper fixed air passage. This is controlled in the usual manner and equipped with a priming device. The needle valve proper is adjusted underneath and locked by a wing nut. It is claimed of the Planhard carburetor that a perfect mixture is obtainable and that economy of fuel is effected. It is made by the Planhard Manufacturing Company, Kokomo, Ind., with general sales offices located at Philadelphia, Penn.

PLANHARD CARBURETOR



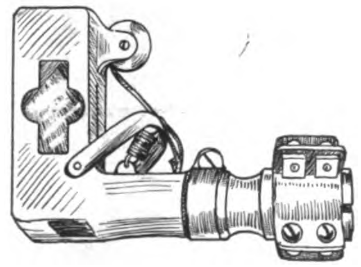
The Blake Q. D. Spark Plug, produced by the Blake Spark Plug Company, Cambridge, Mass., presents interesting features, inasmuch as it may be quickly disassembled without the use of a wrench or other tools. Integral with the mica or porcelain member is a handle and by giving this a quarter-turn the plug is unlocked and removed easily, leaving the threaded part in the cylinder. The recess into which fits the metal member carrying electrode is tapered and a cam guide-like device forces the two parts together making the plug gas tight, and at the same time locking them securely. The handle is covered with wood, thereby preventing shocks when the plug is removed for testing the spark or cleaning the points. It is claimed of the device that these never have to be adjusted. It is of special value on cars not equipped with a priming cup as by the removal of the electrode member gasoline may be inserted in the cylinder without detaching the wire.


BLAKE SPARK PLUG

★

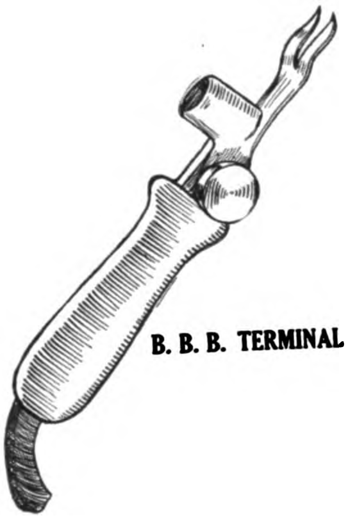
The National Whistle, manufactured by the National Signal Company, Brooklyn, N. Y., is attached to the exhaust pipe of the muffler and is operated by the pressure of the burnt gases. It is constructed of aluminum, trysquare in shape, and is said to be carbon proof and productive of a rich, mellow tone, yet of sufficient strength to be audible over traffic noises. It is fitted with a movable valve which in normal position closes the sound chamber allowing the gases to flow directly out into the open air. When the valve is moved forward by a cable actuated by a pedal, it almost closes the exhaust passage, leaving a small opening through which the gases are forced in a thin air current, these breaking against a sharp edge of the valve and being deflected into the whistle.

NATIONAL WHISTLE



★

The B. B. B. Spark Plug Terminal will appeal to motorists who have experienced the unpleasantness of a shock when testing out a faulty spark plug. It is a combination device inasmuch as it serves as a regular terminal and provides means for proving the action of the spark when the plug is removed and laid upon the cylinder. The terminal is substantially constructed of metal, nickel plated, and may be attached to any type of plug. An enameled wooden handle is fitted to the terminal and is so constructed that the secondary wire may be inserted and locked securely. Being of wood, a non-conductor of electricity, shocks are prevented. The device is made in one size adaptable to any plug, manufactured by the B. B. B. Combination Terminal Company, Dorchester, Mass.


B. B. B. TERMINAL

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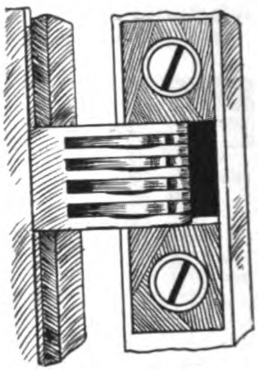
Soss Invisible Hinges are produced by the Soss Manufacturing Company, Brooklyn, N. Y., and are designed for motor cars, although applicable to any type of door. When fitted they hold the door rigid, but provide a perfectly smooth action. They are constructed of a frictionless metal connected by links and are especially adapted where the body of a vehicle is curved. A feature emphasized is that they require less thickness of wood in the post or body, as the width of the plates is 1.125 inches, allowing them to be mounted in a post 1.25 inches wide, and at the same time provide for a throw of one inch. The hinges are made with a separation of .125 inch between the plates and it is claimed they will withstand rough usage. They are finished in black, oxidized copper, bronze, etc. The installation is simple, requiring only screws and washers.


SOSS INVISIBLE HINGE

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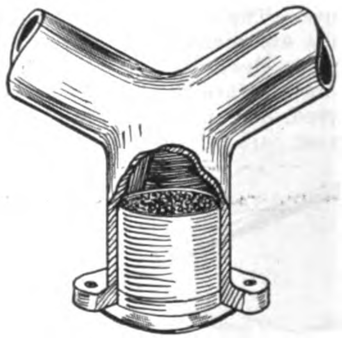
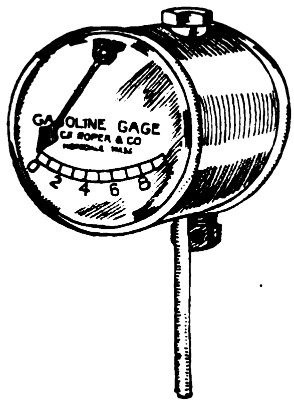
The Crone Vaporizer is a device which may be inserted in the intake manifold of a hydrocarbon motor without alteration to the piping and which does not interfere in any way with making the regular connections mixture tight. The construction is of metal, one end having a lip or extension for fastening it securely. A fitting of corrugated mesh breaks up any raw gasoline that is drawn from carburetor and converts the fluid into a perfect and dry mixture. Being constructed in tubular form it provides a vaporizing surface, according to size, from 150 to 1000 square inches. Back pressure is absent and the mesh will not


CRONE VAPORIZER

clog or get out of order. It is claimed that with the vaporizer, faulty action of carburetors is regulated and that a considerable saving of gasoline is effected. Carbon caused by too much fuel is prevented as well as danger of a backfire to the carburetor. It also is held that overheating of the motor is eliminated, inasmuch as the device provides a dry mixture. It is manufactured by F. G. Crone, Buffalo, N. Y.

ROPER GASOLINE GAUGE



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The Roper Gasoline Gauge is a device for indicating the amount of fuel in the tank. It is fitted to the dash and does not detract from its appearance, being not unlike a speedometer in design. The dial is calibrated in inches and a movable hand indicates the amount of fluid in the tank, whether the car is on the level or a grade. There being no complicated mechanism, there is nothing to get out of order. The gauge is enclosed in a polished brass case, has an enamelled dial and a beveled glass face. It is connected to the fuel tank by a .25-inch copper pipe and is installed easily without special fittings. It is manufactured and marketed by C. F. Roper & Co., Hopedale, Mass.

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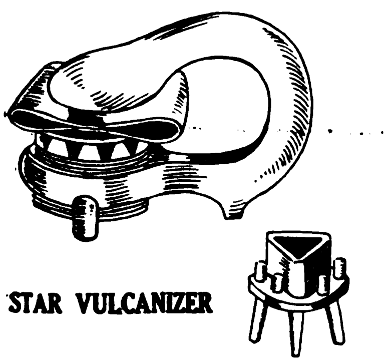
Star Self-Regulating Vulcanizers, manufactured and marketed by the Star Rubber Company, New York City, are designed especially for the motorist who makes his own repairs to inner tubes. They are compact and put up in a strong, nicely finished hinged box adapted for carrying in the car. Being constructed of solid aluminum, they are very light. In practise the tube is clamped between the plates and one of the triangular heat units lighted. These give off the proper heat and the device does not require any watching or adjusting, the temperature being regulated automatically. The heat units come in boxes of 10 and are inexpensive. The equipment includes material for vulcanizing, etc.



STAR VULCANIZER

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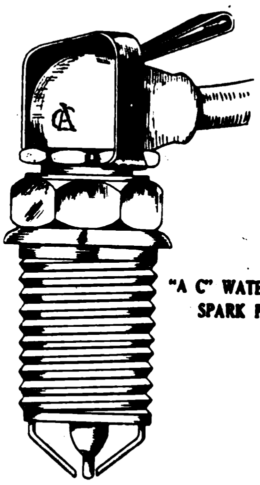
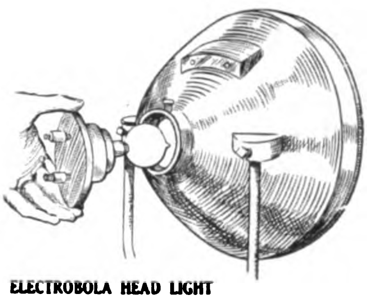
The AC Waterproof Spark Plug being marketed by the Champion Ignition Company, Flint, Mich., is rather unique in construction, as the waterproof feature is obtained by the design of the plug itself, instead of by extra fittings. Attached to the centre electrode is a vertical coiled spring which passes through a recess in the porcelain hood. The latter has a short sleeve inside the plug, and is held in position by a spring clip. The opening through which the secondary cable passes into the hood to the electrode is horizontal, fitted with a tube about .75 inch long, and threaded for the purpose of screwing in the cable securely. This arrangement prevents water short circuiting the member. An advantage of the new device lies in that after the hood is removed, as it may be detached when the plug is taken from the cylinder, there is no exposed insulation to be broken by careless handling.



"A C" WATERPROOF SPARK PLUG

—— ★ ——

Electrobola Headlights are manufactured by the Electrobola Lamp Company of Milwaukee, Wis., from one piece of aluminum casting which is machined carefully and presents an unusually highly polished interior. The device is dust as well as moisture proof, as its design is such that any replacement of bulbs does not require the opening of the front, this part being fastened securely. An Edi-Swan socket for bulb and outside connection is utilized and this arrangement permits of easy removal of the member for inspection. The leads are attached to two terminals on the outside and by disconnecting the wires the part may be removed as a whole. It is held in position by a locking screw. It is claimed that the lamp will furnish a bright, white light which will cover the road fully.



ELECTROBOLA HEAD LIGHT

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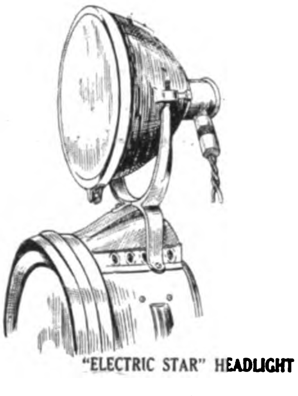
The Electric Star Combination Headlight is an auxiliary lamp that should interest motorists who reside in the suburbs not lighted, as by merely pressing a button the device will illuminate the road for a considerable distance. Under the usual conditions the driver upon reaching the city limits is obliged to stop his machine and light the acetylene members in order to traverse a short distance over an unlighted highway. In stormy weather this is a disagreeable task. The Electric Star lamp is fitted with brackets and may be placed on the regular gas lamp easily. The brackets are constructed with a three point suspension, insuring rigidity and eliminating any possibility of their vibrating loose. They are operated by an electric battery and equipped with the Edi-Swan candelabra bayonet socket, which by turning to the left loosens a screw permitting an easy removal of the member and bulb. The

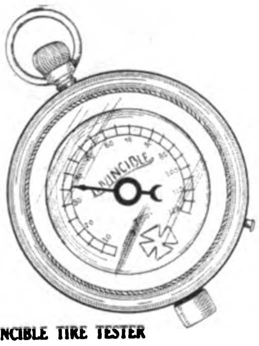


"ELECTRIC STAR" HEADLIGHT

lamps have a large roll rim which adds to their appearance. They are marketed by the Milwaukee Bronze Casting Company, Milwaukee, Wis.

* * *

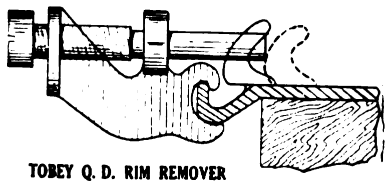
The Invincible Tire Tester is designed for the purpose of ascertaining the amount of pressure in a pneumatic shoe, is similar in appearance to a watch, and is equipped with ringed handle. The dial is graduated and will register a pressure of 120 pounds and a feature of the scale is that the size of tires is marked above the figures so that the operator does not require a knowledge of the amount needed for proper inflation. The instrument is attached in the usual manner and the recording hand remains stationary until released by a button, a feature that will appeal to motorists who are obliged to inflate a shoe in the dark. It is marketed by the Penn Auto Supply Company, Philadelphia.



INVINCIBLE TIRE TESTER

* * *

The Tobey Q. D. Rim Remover is a device manufactured and marketed by William L. Tobey, Boston, Mass., and is designed for the purpose of making easy the removal and replacement of the rims utilized on Universal or Firestone quick detachable tires. It is inserted at the joint of the locking ring of these members and by turning the screw attachment, when the clamp nut is removed from the valve stem and the latter forced up from the rim, the clincher ring is moved away from position indicated in the full lines over the locking member, to the dotted lines so that the ring may be removed easily. The usual practise is to employ a screw driver or chisel, or tools in the regular equipment. In replacing a tire, the inner tube may be inflated enough to prevent any possible pinching of the member and then forced on the wheel by the device which is case hardened and nickel plated. It is compact, weighs less than three ounces and is inexpensive.

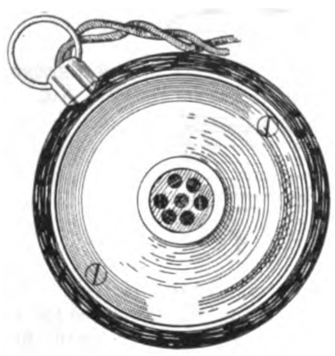

TOBEY Q. D. RIM REMOVER

* * *

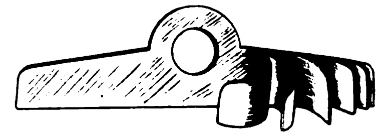
The Bull's-Eye Spark Plug is a device manufactured by the C. G. Blickensderfer Company, Stamford, Conn., which will appeal to motorists as by it the initial step toward remedying ignition troubles is said to be facilitated. Usually when the motor begins to miss, the spark plug is examined, frequently requiring the removal of the member. The Bull's-Eye appliance consists of a regular plug having three windows in the hexagon nut. These are of crystal and through them the spark may be observed. If none be present the faulty cylinder is located promptly. If working properly, a blue light will be visible, and if a bad mixture is being utilized, a yellow light will be seen. The crystal ports are guaranteed against breakage.

* * *

An Electric Cigar Lighter has been brought out by C. Cowles & Co., New Haven, Conn., maker of automobile lamps, exterior and interior mountings and fittings, etc. The device is similar to a watch, being about two inches in diameter and fitted with a ringed handle for the purpose of hanging to a convenient place on the car. It is made of polished brass, nickel, silver or gun metal and mounted in cocobola, ebony, mahogany, or a maple case and may be obtained in blue, drab, green or maroon if desired. The tip is wound with genuine platinum wire which is heated by a six-volt current when a circuit is completed by means of pressing a small knob. The tip of the cigar is lighted by being brought in contact with the heated platinum. A silk cord of ample length is employed for making connection to the battery.

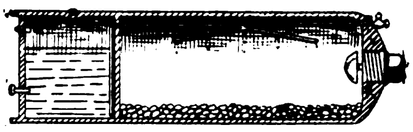

COWLES ELECTRIC CIGAR LIGHTER

Lindhe Laminated Shims will appeal to motorists who do their own repair work as well as to experienced mechanics, as the construction of the device permits a perfect reduction of a shim without the usual filing or scraping when a solid material is employed. In taking up main bearings and connecting rods, the desired space is filled easily with the Lindhe member as it is made of thin layers of brass held firmly together by a metallic binder. Each layer allows an accurate adjustment of .001 inch. To use the shim, one corner of a layer is loosened and peeled off, and this operation repeated until the proper size is obtained. In overhauling bearings of motors it should save time as well as labor. It is manufactured and marketed by the Lindhe Shim Company, New York City.


LINDHE LAMINATED SHIM

* * *

The Carbo-Light Tank is manufactured by the Carbo-Light Company, Anderson, Ind., and it is claimed the device generates gas only when the lights burn and that it furnishes a clean, dry acetylene, which is filtered under pressure and may be charged easily. It consists of a steel, rust proof tank, constructed of a high grade material and is six inches in diameter and 22 in length. It comprises two compartments, the smaller being for water and the larger for the carbide, six pounds of which may be used. The latter is introduced through a large opening which is fitted with a screw plug, while a smaller similar member located on the top of the vessel is utilized for replenishing the supply of water. A small cup is fitted to the larger plug and in this is placed a little water before replacing the part. This fluid acts upon the carbide, generating gas until the large chamber is filled. It is claimed by the maker that there is a constant supply of acetylene of high quality, that the tank is charged easily, and that an economy of carbide is effected.

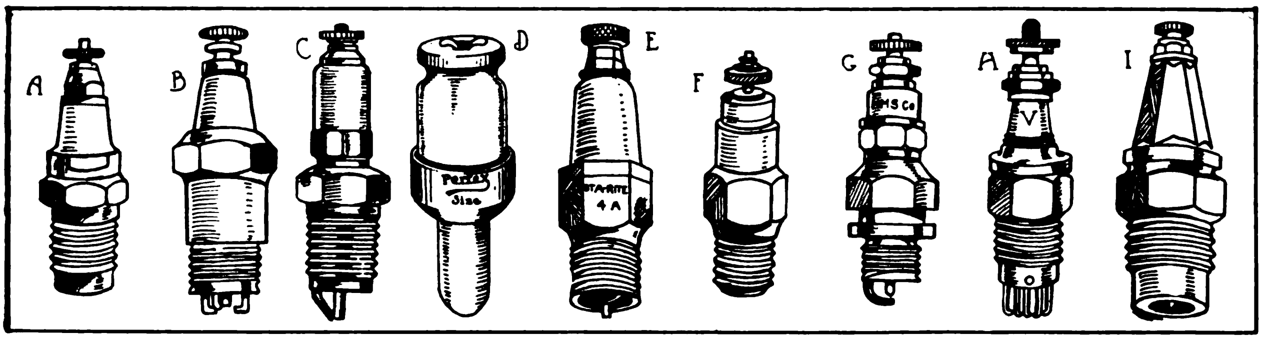

CARBO-LIGHT TANK GENERATOR

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

DEVELOPMENTS IN SPARK PLUGS.

The spark plug industry has been increased the past year by advent of a number of enterprises that produce plugs as a whole or a part of their manufactures, some of them on extensive scales, but there has been comparatively little brought out that is really new. There have been no radical changes in principle, and aside from construction or methods of manufacture the variance is trifling. There is no question, however, that there has been endeavor made to secure more enduring and more reliable plugs, and this has led to improved workmanship and more careful production with a view of eliminating conditions that make for failure under the extreme heat and the continuous vibration. Of course the main proposition with all manufacturers has been to develop plugs in which a spark of sufficient proportions will be produced under the widest change of operation, and to obtain such results attention has been directed toward more accurate machine work and especial care in assembly and test of the finished product.

The introduction of highest class machinery has been a reason for material improvement, and the utilization of special gaskets to insure against leakage and loss of compression, the adoption of forms to eliminate or minimize twisting and breaking stresses, the better insulation of the electrodes and the protection of the mica and porcelain cores, the shaping of and placing the electrodes to make certain the creation of a sufficient spark, and the installation of means for visual observation of the spark, are among some of the features of the latest plugs. It will be understood that the use of special machinery means interchangeability of the parts, which makes for decided economy when a motor is in operation for a season in a vehicle. Though there are those who specialize the cheaper forms of spark plugs there are others who are producing the highest classes and the prices range over quite as wide a scale as in previous years.



Spark Plugs: A, Miller; B, Bosch; C, Mosler; D, Perfex Porcelain; E, Sta-Rite; F, Herz; G, H. M. S.; H, V-Ray; I, Splitdorf.

Bull's Eye.

One of the most interesting of the new plugs is the Bull's Eye, made by the G. C. Blickensderfer Company, Stamford, Conn. This plug has a heavy brass shell with the upper end forming a hexagon seat for the wrench. Three sides of the hexagon are drilled and into these threaded holes are seated heavy quartz lenses. The core is in two sections with the electrode divided to form a spark gap. The lower part of the core is contained in the shell and the upper section in the bushing. The bushing is seated into the shell bringing the electrode ends into correct relation. At the base of the core the electrode projects below the base of the shell and the shell electrode is extended toward the centre, forming the second spark gap of the plug. The core is of porcelain and it is capped with metal, above which is the terminal. As the spark is made it appears in the chamber of the spark plug as it ought to appear in the cylinder. It is claimed that by the use of this plug it is possible to detect a defective circuit, faulty carburetion or leaky valves, and to maintain a condition insuring satisfactory combustion, as well as protecting the engine against carbonization.

Visible.

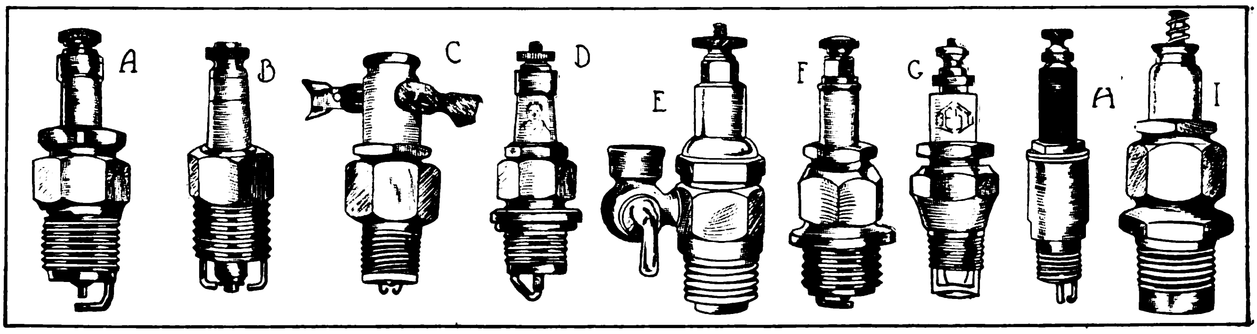
Somewhat similar to this is the Visible spark plug, made by the Visible Spark Plug Company, Detroit, Mich., which has a porcelain core through which is a transverse hole. This hole is open to the air and it exposes the core electrode which is divided with the parts so set that they require the current passing through the electrode to jump the air gap. Through the hole the size and color of the spark may be observed. Aside from this the construction of the plug is conventional, the core electrode projecting and the shell electrode extending toward and below the centre of the core. For this plug the maker claims that the condition of the electrodes, the quality of the ignition and the efficiency of the battery and the magneto may be learned by observation; the engine may be timed without trouble, and the firing spark is intensified with more instantaneous combustion and greater power.

Rex.

The Rex spark plug, made by the Rex Ignition Manufacturing Company, New York City, is another production for which particularly strong claims are made. It is the manner of construction that is maintained to give unusual results, in that the plug is guaranteed not to be short circuited through soot or from any other cause, and it is held that with the unusually hot spark produced the electrodes are constantly free and clear. The plug is exceedingly simple and it is made in all sizes for automobile, yacht and motorcycle engines. The porcelains are of finest material and guaranteed to withstand the heat. The electrodes are of specially imported wire which will not burn under intense heat.

All-in-One.

The All-in-One spark plug, made by the Frontier Specialty Company, Buffalo, N. Y., is of conventional design aside from the installation of a compression relief and priming cock at the top of the shell. These cocks are of differing shapes and lengths to permit installation of the plugs in motors of various types,



Spark Plugs: A, Hot-Spark; B, Jewell; C, Edison; D, Red Head; E, All-in-One; F, Firefly; G, Best; H, Sootless; I, Black Eagle.

whether conventional, horizontal or with recessed plugs. These are specially adapted for engines which are not equipped with compression release cocks, either for automobile or marine purposes. By priming the motor at the spark plugs it is claimed that starting is facilitated under any circumstances, while cleaning may be accomplished without difficulty by use of gasoline on the spark plugs, or kerosene may be utilized for freeing the cylinders of carbon.

H. M. S.

The H. M. S. spark plug is made by the Hartford Machine Screw Company, Hartford, Conn., under pending patents and was designed with experience obtained in the manufacture of more than thirty millions of plugs for others. The porcelain, for instance, is made from imported clay and it is of a form that is claimed to give heretofore unknown strength. The porcelain has but one gasket for making up the joint in the body, the design being such that the expansion and contraction of the core and the metal parts are practically in one direction, minimizing all possible strains. The plug is gas tight and has survived every test. The core and core electrode are assembled as one unit and can be removed from the shell by unscrewing the bushing. The core electrode extends below the shell and the shell electrode curves under it. The design is such that an unusually hot spark is created and it is claimed that if the electrodes are completely immersed in oil the plug will spark continuously and indefinitely and without miss.

Mac-Kae.

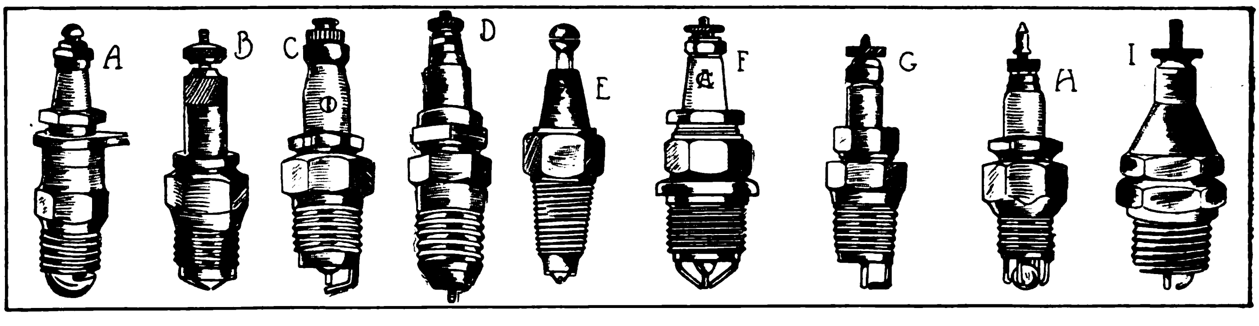
The Mac-Kae spark plug, made by the Mac-Kae Manufacturing Company, Boston, Mass., is claimed by the maker to give a very large and efficient spark and to afford superior ignition under all conditions. It is made with either porcelain or mica core. The porcelain cores are made with the core electrode of an alloy of platinum-iridium and nickel baked into the core, and as this electrode has the same coefficient of the porcelain, is not affected by the extremes of heat. The cap of the core is keyed on by a patent process, a solid unit being formed. By unscrewing the brass bushing of the plug the core may be removed as one piece. With the mica cores the centre electrode is wound laterally with sheet mica which is surrounded with mica washers, compressed and securely locked. Both porcelain and mica cores are interchangeable with any Mac-Kae plug. These plugs are sold with a guarantee against any defect of material or workmanship. They are made in all sizes.

Bosch.

The Bosch spark plug, made by the Bosch Magneto Company, New York City, is designed specially for high-tension magneto service. The plug consists of three parts, a steel shell, a one-piece insulator and the core electrode. The insulation is of steatite, which is not brittle and will not deteriorate through extreme heat, great pressure or free lubrication, the material and form eliminating all joints and insuring against leakage under a pressure of 750 pounds to the square inch. The shell electrodes are three in number and are crescent shaped, which form is claimed to have less electrical resistance and to produce a spark that is a sheet of flame, giving an efficient ignition at slow cranking speed of the motor.

V-Ray.

The V-Ray spark plug, made by the M. M. M. M. Company, Marshalltown, Ia., is assembled with a deep shell from which four long electrodes extend downward and turn sharply toward the centre, penetrating the combustion chamber of the motor to a much greater depth than the average plug. The points of these electrodes are tapering and they converge close to the end of the core electrode, which is made with a semi-circular groove in the end. The core electrode is increased in diameter before it enters the core and it is firmly assembled and retained by a nut at the top, on which is fitted the terminal nut, which is long and tapered. It is claimed that the plug will produce an unusually fat and powerful spark and that it will not soot or corrode, the peculiar form of the electrodes making them self-cleaning. The porcelain is said to be fracture proof and the plug is sold with a very broad guarantee as to quality and service.



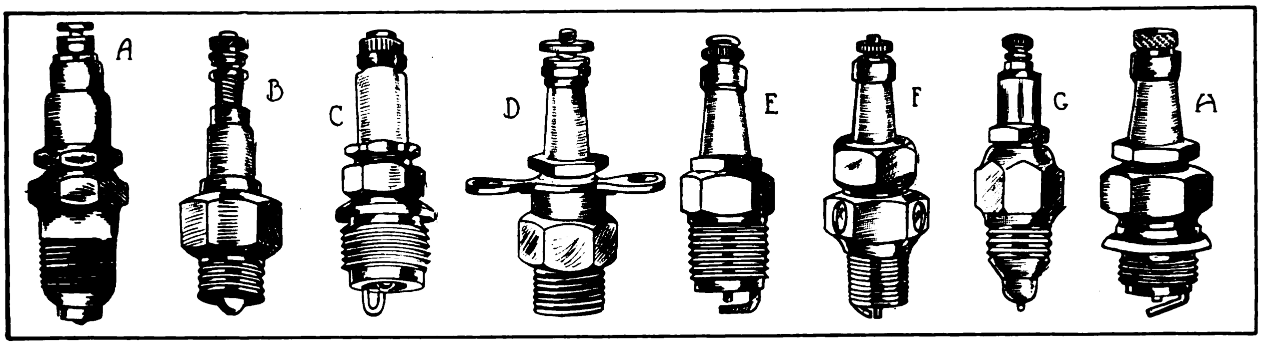
Spark Plugs: A, Spitfire; B, National; C, Visible; D, Never-Miss; E, Anderson; F, AC; G, Benford; H, T-A-D; I, Kingston.

Black Eagle.

The Black Eagle spark plug, made by the Progressive Manufacturing Company, Torrington, Conn., is a new product that is popular in price and has qualities that are claimed to be unusually efficient. The shell is of metal into which is seated a brass bushing carrying the porcelain core and electrode. The two shell electrodes are parallel and midway between them is the core electrode, and as the round surfaces of the electrodes are presented to the sparks as they are formed, this minimizes or prevents pitting and destruction of the sparking points. Between the solid cap of the core electrode and the binding nut of the core there is a sliding collar and it is normally kept in contact with the binding nut by a spring between the collar and terminal cap. Any wire winding or terminal placed between the collar and the binding nut is firmly held by the tension of the spring. This device is patented and is known as the Universal Spring Cap.

T-A-D.

The feature of the T-A-D Flash Ball spark plug, made by the Toledo Auto Devices Company, Toledo, O., is the formation of the end of the core electrode, which is a ball. The shell electrodes are four in number and these extend downward into the combustion chamber and turn sharply at right angles, the ends of the electrodes being in proximity to the greatest diameter of the ball. As the current is distributed four sparks are made simultaneously in the cylinder. The area of the ball is such that the plug is self-cleaning as well as there being elimination of all possibility of pitting and destruction of the electrode points, as might be possible with a single air gap. The plug has a porcelain core and is otherwise conventional.



Spark Plugs: A, Mezger; B, Ballite; C, Reliance; D, E-Z; E, Mac-Kae; F, Bull's Eye; G, Sharp; H, Rex.

Splitdorf.

The well known Splitdorf plug, made by C. F. Splitdorf, New York, has been improved so far as the construction of the mica cores are concerned, this being by increased taper of the steel rod forming the core electrode. This rod is wound with selected sheet mica and the mica washers are forced on under heavy pressure, the construction being such as to insure against any possibility of leakage. The appearance of both mica and porcelain plugs has been improved by the addition of ornamental washers at the top and bottom of the external insulation.

Herz.

The imported Herz Bougie Mercedes spark plug, for which Herz & Co., New York City, is American sales agent, has been perfected by installing at the base of the shell in the place of the shell electrode a disc into which four holes are cut so as to remove the centre and leave four points which are equally spaced from the core electrode. When the current is made and broken four sparks are formed simultaneously and there is proportionately increased combustion in the cylinder. The insulation of the plug has been protected by a coating of blue enamel, which adds to its appearance.

AC.

The Champion Ignition Company, Flint, Mich., has produced the AC Star spark plug in which the porcelain insulation is in three parts and the electrode is divided. The base carries the core electrode and there is a recess about the upper parts of the electrode into which a porcelain tube that surrounds the electrode is fitted. Above the tube is a spring that surrounds and contacts with the lower end of the electrode in the upper porcelain section. About the upper section is the bushing that seats into the shell. This construction is said to insure against breakage from vibration, heat or expansion. There are two shell electrodes and two sparks are made in the cylinder at the same time. The AC Waterproof plug is made with practically the same construction as the AC Star, but it has a peculiarly formed porcelain hood and combination terminal that is connected with the cable and clamped on to the plug in place of the upper porcelain. The other lines of this concern have not been changed.

Champion.

The line of the Champion Spark Plug Company, Toledo, O., which is said to be produced in the largest spark plug factory in the world, includes six models, five of them with porcelain cores and one with mica core. These are to meet differing needs with different types of motors—in fact the company claims to make a plug for absolutely every type of engine. These plugs are sold with a guarantee against breakage by heat.

Miller.

The Miller spark plugs, manufactured by Chas. E. Miller, 97-103 Reade street, New York City, include mica, porcelain and magneto types. The magneto plug is made with a shell, the circular base of which forms the electrode. From the porcelain core the electrode terminates in a disc with a serrated edge, and between the points of the disc and the shell a number of sparks are formed each time the current is made and broken. The Miller mica plug has been manufactured for seven years and the porcelain plug was produced to meet a demand for this type. It has a deep seat in the cylinder and a long centre electrode, insuring rapid and complete combustion in the engine cylinder.

Flash Light.

The Flash Light spark plugs, made by Janney, Steinmetz & Co., Philadelphia, Penn., have been continued without material change in design and are produced with the same care and with the superior facilities and material that has established them as a standard product in the market.

Standard and Reliance.

The Jeffery-Dewitt Company, Detroit, Mich., has increased its product by the addition of the Standard, a popular priced spark plug which has many of the qualities and features of the Reliance line, which is finished a dull black. With the Reliance plugs a feature is that the core electrode is a fine platinum wire baked into the porcelain and finished flush with the lower end, this being amply protected, while the intense heat generated by the spark has a cleaning influence. This company also produces the Edison Double Spark plug, which has not been changed in design.

Sta-Rite.

The production of the R. E. Hardy Company, Chicago, Ill., which includes the Sta-Rite, Venus, Vulcan and Gotham spark plugs, have been practically unchanged, these products being sold under a broad guarantee of satisfaction. The Hardy line has been developed and manufactured on nine years' experience.

Best.

The Best plug, made by the Best Ignition Equipment Company, New York City, is designed with a bushing that affords direct pressure on the porcelain core without a twisting stress, and the core electrode is a circular disc centred in the base of shell, the spark forming at varying points the entire circumference of the disc.

Delta.

Practically no change has been made in the models made by the Delta Manufacturing Company, Bloomfield, N. J., these being continued because of the extreme satisfaction obtained through long and continued use.

Spitfire.

The buyers of Mosler Spitfire and Breechblock plugs are now offered the option of purchasing porcelain cores in which the electrodes are tipped with platinum, as a further resistant to deterioration. Other than this the plugs are made to the original designs by A. R. Mosler & Co., New York City.

Hot-Spark.

The Hot-Spark spark plug, made by the Hot-Spark Plug Company, Detroit, Mich., is composed of five pieces, the shell, bushing, gasket, porcelain core and electrode and the terminal nut. These are solidly constructed and the bushings are case hardened to resist contact with wrenches. They are especially designed for use with self-starting engines, where the spark required for ignition is hot and strong.

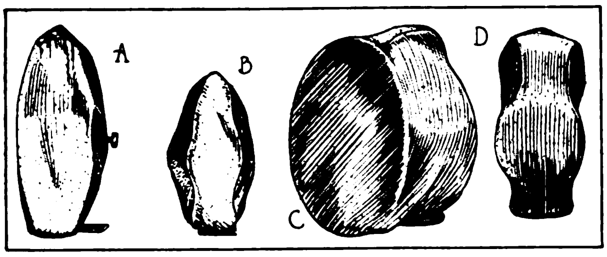
Fire-Fly.

The Fire-Fly and the Sharp spark plugs, made by the Sharp Spark Plug Company, Cleveland, O., have been practically unchanged, the former being with porcelain core only, and the latter with both mica and porcelain.

The Monarch spark plugs, made by the Benford Manufacturing Company, Mount Vernon, N. Y.; the Ideal spark plugs, made by the Ideal Switch Company, Plainville, Conn.; the Never-Miss spark plug, made by the Lockwood-Ash Motor Company, Lansing, Mich.; the Sootless and Comet plugs, made by the Oakes & Dow Company, Boston, Mass.; the Anderson spark plug, made by the Anderson Spark Plug Company, Washington, D. C.; the E-Z spark plug, made by the Autoparts Manufacturing Company, Jersey City, N. J.; the Kingston spark plug, made by the Kokomo Electric Company, Kokomo, Ind.; the Mezger spark plug, made by C. A. Mezger, Inc., New York, N. Y.; the Jewell, made by the Pittsfield Spark Coil Company, Dalton, Mass.; the Ballite, made by the G. A. Walker Machine Company, Boston, Mass., have been continued practically without change. These are all standard plugs, are well known in the market and are extensively used.

NEW DESIGNS FOR LAMP COVERS.

The benefits accruing from fitting covers to the lamps of the motor car are numerous, and there is a growing tendency to protect the lights from moisture and the inclemency of the weather. Where gas and oil members are employed particles of dust find their way into the burners, etc., impairing service. In traversing muddy roads the covers not only prevent the accumulation of dirt but preserve the brightness of the metal.



Hopewell Lamp Covers: A, Square Side; B, Tail; C, Searchlight; D, Round Side.

Hopewell.

The design of the lamp covers manufactured by Hopewell Bros., Newton, Mass., is such a perfect fit is assured, and these members are made to conform to the shape of any standard lamp. They are made for head, side and tail lights, and generators as well. The lamp covers are of rubber, fleece lined, although fabric leather in colors is produced. The devices are fastened easily by a patent clasp, are inexpensive, and are unaffected by heat, water, grease or dirt.

Gilbert.

The Gilbert Manufacturing Company, New Haven, Conn., makes a specialty of covers for side, head and tail lights for automobiles. These are manufactured in a variety of designs to meet different requirements. They are so constructed that they fit the lamp snugly and the flaps are secured by clasps and straps, the latter being utilized on the head devices.

Premier.

Water and dust proof lamp covers form a part of the production of the Premier Novelty Manufacturing Company, New York City, which concern manufactures these devices in many shapes and sizes to conform to the standard lamps upon the market. The company claims to be the original concern to utilize the button lock flap cover, with which its goods are equipped.

Cowles.

C. Cowles & Co., New Haven., Conn., produce a large variety of lamp covers, these being made in standard forms to fit oil, gas and electric lamps. The covers are water proof, with seams sewed and cemented, and the material comprises a lustre or a dull finish. The concern makes a specialty of covers for limousine lamps, these being manufactured with an improved seamless head.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

The Fairchild Electric Vehicle Company, Brooklyn, N. Y.; capital, $50,000; incorporators, Frank K. Fairchild, Marcus A. Fairchild, Arthur E. King.

The J. H. Kinney Company, Indianapolis, Ind.; capital, $10,000; incorporators, J. H. Kinney, H. L. Whipple, G. E. Snyder.

The Clifford Auto Company, Monticello, Ind.; capital, $15,000; incorporators, T. W. O'Connor, M. Clifford, E. J. Sexton.

Bristol Automobile Company, Waterbury, Conn.; capital not given; president, E. H. Bristol; treasurer, B. H. Bristol; secretary, B. B. Bristol.

Motor Car Specialty Company, Fort Worth, Tex.; capital. $5000; incorporators, E. E. Hose, F. H. High, R. R. Gilliland.

Elkins Automobile Company, Elkins, W. Va.; capital, $5000; incorporators, Thomas Donohoe, G. W. Adamson, E. O. King, E. D. Talbot, W. C. Poston, S. B. Hoffner, S. O. Billings.

The Wollaston Center Garage Company, Quincy, Mass.; capital, $25,000; incorporators, Albert C. Winsloe, Mabel McQuade, Charles C. Beatey.

The Jackson Petroleum Motor Company, Augusta, Me.; capital, $500,000; incorporators, E. M. Leavitt and others.

The Turnbull Auto Company, Willimantic, Conn.; capital, $25,000; incorporators, David A. Turnbull, Frederic J. Wood, William M. Turnbull, Alice Turnbull, Elizabeth G. Turnbull.

Excelsior Specialty Company, Jersey City, N. J.; capital, $30,000; incorporators, Ferdinand Thomassin, Frederick Lockwood, Albert Higson, Gustav H. Martens, Charles S. Goodfellow.

Harry F. Grant Company, Boston; capital, $50,000; incorporators, Harry F. Grant, Hugh Miller, William E. McKee.

Salem Automobile Service Company, Salem, N. J.; capital. $25,000; incorporators, George D. Jacquette, Ashton Lawrence, Clare E. Jacquette, William E. Allen.

Central Auto Supply Company, Indiana Harbor, Ind.; increase of capital stock to $600.

Stoddard-Dayton Motor Company, Hartford, Conn.; capital, $5000; incorporators not given.

Waterbury Automobile Company, Waterbury, Conn.; capital not given; president, Jennie S. Williams; treasurer, John T. Williams.

Bryant Sales Company, New York City; capital, $15,000; incorporators, William B. Haggerty, Frank P. Mansfield, 127 Duane street; Mary E. Wilson.

The Tire Trading Company, Wilmington, Del.; capital, $50,000; incorporators not given.

Monroe Garage Company, Monroe, N. Y.; capital, $3000; incorporators, William S. Jessup, Harriet S. Jessup, William F. Griffin.

Springfield Auto Sales Company, Springfield, Mass.; capital, $35,000; incorporators, B. W. Ogg, F. T. Keisaker, L. S. Winegar.

Empire Automobile Company, Indianapolis, Ind.; capital, $100,000; incorporators, Cecil E. Gibson, A. Waldheim, David May, David Sommers, Charles B. Sommers.

Owens Wagon & Automobile Works, Charlotte, N. C.; capital, $50,000; incorporators not given.

Storm Motor Car Company, Wilmington, Del.; capital, W. I. N. Lofland.

Detroit Auto Training School, Detroit; capital, $5000; incorporators, Gaylord C. Brunner and others.

C. A. Scott Company, Portland, Me.; capital. $10,000; incorporators, Hugh Lawless, Charles A. Scott.

The Porto Rico Motor Company, Greenwich. Conn.; capital, $150,000; incorporators, Milton A. Mills, Jr., Loring J. Whiteside, Edward J. Ryan.

The Burrough-Morse Company, Providence, R. I.; capital, $25,000; incorporators, Howard D. Burrough, E. H. Morse, Howard Sheffield.

The Sutherland Automobile Air Appliance Company, Louisville, Ky.; capital, $10,000; incorporators, Luke Sutherland and others.

The Auto Sales Company, Boston; capital, $25,000; incorporators, E. Leroy Pratt, George E. Golding, George M. Faulkner.

Morris Motor Sales Company, Indianapolis, Ind.; capital, $10,000; incorporators, Theodore H. Morris, Paul H. Krauss, Fred C. Krauss, Paul H. Krauss, Jr., Otto Krauss, Donald S. Morris.

Rudolph Aeroplane Company, Newark, N. J.; capital, $125,000; incorporators, Frank Baur, Bertha Baur, F. W. A. Rudolph.

Victor Automobile Company, Evansville, Ind.; capital, $8000; incorporators, P. P., W. E. and J. F. Fellwock.

The Postles-Prouse Company, Willimington, Del.; capital, $50,000; incorporators, G. P. Postles, Shanley D. Prouse, John H. Willet.

Alpha Rim Company, Brooklyn, N. Y.; capital, $125,000; incorporators, L. Kreielsheimer, A. S. Friend, H. W. Stowell, L. E. Swarts.

Buffalo Electric Vehicle Company, Buffalo, N. Y.; capital, $1,000,000; incorporators, W. J. P. Seipp, W. C. Feuchter, T. R. Wheeler.

Englewood Motor Car Company, Chicago; capital, $1000; incorporators, Christian Londelius, Jr., A. U. Jackson, John F. Wagner.

Decker Bros. Lock Nut & Bolt Company, Saco, Me.; capital, $300,000; incorporators, M. L. Decker, Maxwell, Neb.; E. E. Bean, Saco, Me.

H. N. Stackpole and T. C. Luce, Pittsfield, Mass., have formed the S. & L. Company and will have headquarters at Lowe's garage, 241 South street, where they will conduct a general repair business.

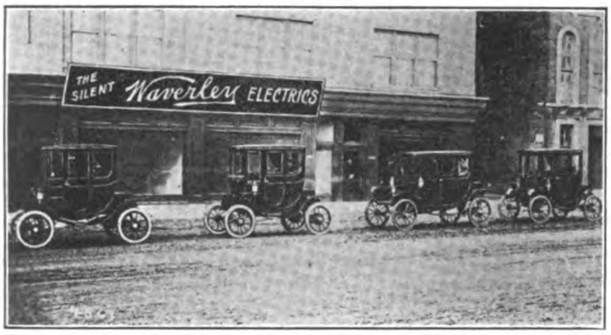
The Seabury-Carson Company, Logan, Ia.; capital, $48,000; incorporators, D. H. Seabury, C. W. Carson, A. W. Gainess.

Morrow-Mercury Motor Car Manufacturing Company, Los Angeles, Cal.; capital, $20,000; incorporators, J. B. Morrow, Samuel Brown, Jr., O. B. Hutchings, J. R. Fouch.

Delegation of Ford Dealers Who Visited the Plant of the Ford Motor Company at Detroit Where They Were Royally Entertained by the Company.

Kelly, Damon Auto & Supply Company, Brockton, Mass.; capital, $25,000; incorporators, George E. Damon, Stephen H. Kelley, George F. Damon.

The Tucker Garage Company, Inc., Middletown, Conn.; capital, $12,000; incorporators, Willard D. Tucker, G. Howard Tuttle, Clare H. Blatchley.



Fleet of Waverley Electrics, Recently Shipped by the Waverley Company, Indianapolis, Ind., to Its Philadelphia Representative.

Omaha Motor Car Company, Augusta, Me.; capital, $1,000,000; incorporators, R. S. Buzzell, L. J. Coleman, C. L. Andrews.

Grant Motor Truck Company, Cambridge, Mass.; capital, $100,000; incorporators, Frank S. Corlew, Harry F. Grant, George L. Ellsworth.

Staunton Motor Company, Staunton, Va.; capital, $4000; incorporators, J. W. H. Pilson, G. A. Allen, J. L. Baugher.

Salt Lake Automobile Company, Salt Lake City, Utah; capital, $25,000; incorporators, J. E. Langford, Ashby Snow, A. L. Taylor.

Standard Auto Renting Company, New York City; capital, $10,000; incorporators, David C. Goodman, William Machol, Edwin B. Koenig, 1190 Madison avenue.

Steinbock Engineering Company, Edgewater, N. J.; capital, $1,000,000; incorporators, E. J. Forhan, F. B. Knowlton, J. MacLaren.

Dennis Motor Company, Toledo, O.; capital, $25,000; incorporators, H. H. Dennis, G. W. Close, Allen E. Reid, R. S. Woodrow, John C. Meister.

The Williams Auto Company, Boston; capital, $2500; incorporators, William T. Hanley, James Hanley, Frederick W. Ryan.

Gray & Davis, Inc., Amesbury, Mass.; capital, $1,250,000; incorporators, William Gray, Alexander Churchward, David B. Kerr, William B. Moses, D. Henry Elkins, William H. Gray.

Union Gear & Machine Company, Boston; capital, $10,000; incorporators, Jay D. Benton, George A. Kearsley, Francis D. Harrigan.

Seymour Auto Company, Seymour, Conn.; capital, $4000; president, Maurice L. Warner; vice president, Thomas S. Coleman; treasurer, Ernest S. Clark.

Oakes Manufacturing Company, Indianapolis, Ind.; capital, $10,000; incorporators, W. D. Oakes, Cora P. Oakes, W. H. Oakes.

Self-Spreading Cotter Pin Company, Wilmington, Del.; capital, $250,000; incorporators, M. L. Rogers, S. E. Roberson, H. W. Davis.

Eyles Auto Wheel Company, Chicago; capital, $2000; incorporators, George A. Chritton, John H. Lee, R. A. Raymond.

Mansfield Tire & Rubber Company, Mansfield, O.; capital, $300,000; incorporators, Walter F. Heene, C. R. Grant, F. M. Bushnell, B. L. Chase.

Taxi Service & Baggage Corporation, Wilmington, Del.; capital, $150,000; incorporators, W. J. C. Delaney, W. L. Lamderdin, A. P. Thom, Jr., Norfolk, Va.

Boulevard Motor Delivery Company, Chicago; capital, $2500; incorporators, C. H. McDonough; C. D. Black, George H. Davis.

Krebs Commercial Car Company, Clyde, O.; capital, $100,000; incorporators, J. C. Krebs, R. A. Becker, F. X. Bachle, Homer Metzger, George Slessman.

The New Columbia Garage Company, West End, N. J.; capital, $10,000; incorporators, Arthur J. Seeney, Stephen C. Fiero, George Feinberg, all Brighton avenue, West End, N. J.

GARAGE & DEALER

Fred S. Willard and O. M. Decker, Utica, N. Y., have formed a partnership under the firm name of the Genesee Auto Sales Company and will conduct a general automobile business at 364 Genesee street. Both are experienced mechanics.

William Klokau, Davenport, Ia., who conducts a garage on 16th street and Fourth avenue, will construct a three-story brick building on the same premises. It will be modern in every particular.

The William J. Hawley Automobile Company, Canandaigua, N. Y., has purchased the Seaman Garage in Phenix street and will utilize the new quarters for repairing and storing. The new company is headed by Edson T. Case. William J. Hawley is manager.

Pray Brothers, Fort Dodge, Ia., is at the head of a company which has been formed to erect a new building in which will be installed modern machinery including an apparatus for welding automobile parts by the oxy-acetylene process.

Baumgardner & Kibby, Toledo, O., distributor for the Marathon, Detroiter and Cass cars, announces its removal into new quarters at 911 Jefferson avenue. A number of sub-agencies have been appointed and others will be made.

The Selden-Maxwell Auto Company, St. Joseph, Mo., announces the opening of new salesrooms at 910 Frederick avenue. The concern handles the Selden and Maxwell pleasure cars and the Sampson trucks as well.

R. L. Kampf has succeeded Kampf & Markland at Armington, Ill., as representative of the Cole, made by the Cole Motor Car Company, Indianapolis, Ind.

The Perry Motor Supply Company, Hartford, Conn., wholesale and retail dealer in motor car supplies, has opened a new store at 102 Allyn street.

The American-Cole Motor Company, Syracuse, N. Y., agent for the Cole and American cars, has moved into a new garage and salesrooms at 215 James street.

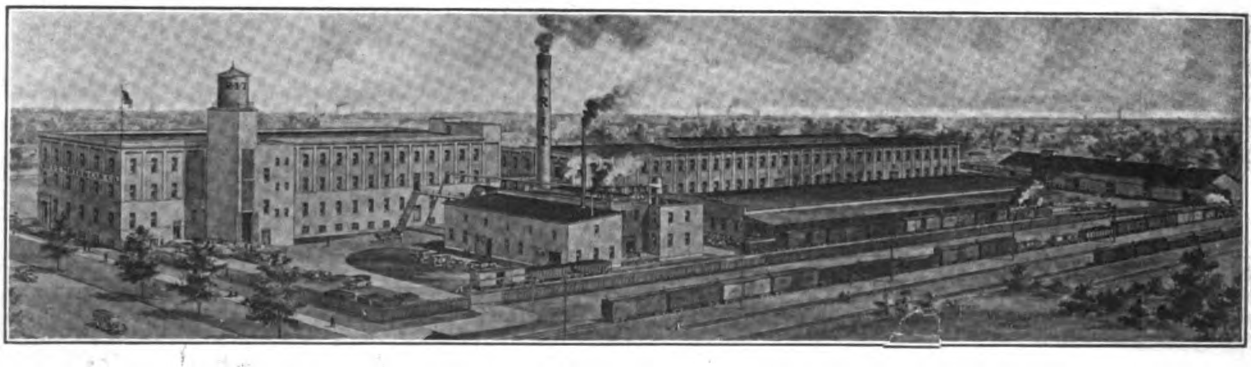
The Morris Motor Car Company, Waterloo, La., is erecting a two-story brick garage on East Fifth street. The structure will cost in the neighborhood of $12,000 and will provide a salesroom 30 by 48 feet which will be located on the ground floor. The upper floor will be utilized for a repair shop and storage.

Camp Bros., New Berlin, N. Y., are constructing a new garage. It will be of fire proof material, 60 by 90 feet, and will contain all modern conveniences to care for automobiles and repair work. G. E. Warner of the Post Garage, Catskill, will be head mechanic.

The Seymour Auto Company, Seymour, Conn., announces the opening of its automobile department in which modern conveniences have been installed for repairing motor cars.

Albert H. and John F. Lohrman, Cincinnati, O., have formed the Cole Motor Sales Company and will distribute the Cole in that city and surrounding territory. The salesroom will be located at Peebles Corner.

The White Motors Company, New Haven, Conn., of which W. A. Rutz is manager, has made application for an increase in capital stock from $5000 to $20,000, this



Showing Two New Additions to the Plant of the K-R-I-T Motor Car Company, Detroit—Another Building Is in Process of Construction, Which When Completed Will Give the Company an Output Four Times That of 1911.

step being necessary owing to the increase in business.

Peter C. Rutan, a well known automobile dealer of Port Jervis, N. Y., has purchased properties on Ball street, and will erect a two-story concrete garage, 25 by 100 feet, which will be an addition to the present building.

The P. N. Montague Garage was opened recently in Charlotte, N. C. The structure is 110 by 180 feet, located on Main street, and is equipped with modern conveniences for the care and maintenance of motor cars.

Fred Seegar, Marion, Ind., has established a garage at 10th and South Washington streets, and will conduct a general storage and repair business.

Stahl & Stone, Topeka, Kan., agent for the Cole line, are occupying new quarters at 621 Quincy street.

George D. Jarvis, Burlington, Vt., is erecting a two-story garage of fire proof material on South Winooski avenue. The structure will be 56 by 130 feet and will be known as Jarvis' Palace Garage. The garage proper will be at the rear and will be fitted with modern equipment throughout.

The New Bedford Auto Selling & Supply Company, New Bedford, Mass. is occupying new quarters in the Coffin building, Spring and Pine streets. The concern is agent for the White line, made by the White Company, Cleveland, O.

The Means Auto Company, Des Moines, Ia., is occupying new quarters on 12th street, the change being necessary owing to a rapidly increasing business.

Holloway & Naville have succeeded Bryant & Holloway at Lafayette, Ind, Clarence Naville having acquired the interests of E. L. Bryant. The garage is located at 210 Columbia avenue.

Charles Schuster, for two years sales manager for the Cadillac in Cincinnati, O., has resigned to accept a similar position with the Cole Motor Sales Company of that city.

Joseph W. Rice, Gloucester, Mass., is erecting a new garage which will provide accommodation for a large number of machines.

Staacke Bros., San Antonio, Tex., has dissolved, A. E. Staacke retiring. The business at 135 West Commerce street will be conducted hereafter by H. G. Staacke.

V. Durand, New Orleans, La., agent for the Amplex, made by the Simplex Motor Car Company, Mishawaka, Ind., has appointed the following sub-agents: Tartimer & Boudreaux, New Orleans; Thibaut & Leblanc, Klotzville; J. U. Folse, Paincourtville; Emile Dupont, Houma; G. W. Leah, Morgan City.

Le Hardy & Lindsay, Rochester, N. Y., agent for the Marmon car, made by Nordyke & Marmon Company, Indianapolis, Ind., has moved to new quarters at 1189 University avenue.

G. C. Hobson, formerly in charge of the promotion department of the Henderson Motor Sales Company, Indianapolis, Ind., has become cashier of the Cole Motor Company of Atlanta, Ga.

S. J. Wise & Co., New York City, has opened a branch house at Boylston and Fairfield streets, Boston, where a full line of the King car, made by the King Motor Car Company, Detroit, will be carried.

Albert Bale, Hinckley, Ill., has been appointed agent for the Velie line, made by the Velie Motor Vehicle Company, Moline, Ill. He will maintain a service department. His territory includes De Kalb, Lee, Ogle and Kane counties.

William B. Kershaw, 44 Hicks street, Pawtucket, R. I., announces that he is prepared to handle all kinds of repairs to automobiles tires and inner tubes

The Kokomo Auto & Machine Company, Cole agent at Kokomo, Ind., will be known as C. F. Seward & Son hereafter.

Mueller Bros., Pittsburg, Penn., representative for the Alco line, has taken over the agency of the Haynes car, made by the Haynes Automobile Company, Kokomo, Ind.

The White Automobile Company, Pittsburg, Penn., has broken ground for a new garage and salesroom at the former site of Luna Park. The new building will be completed in June, will be of concrete and terra cotta, and will cost approximately, $100,000.

The Federal Motor Car Company of Pittsburg, Penn., who until recently represented the Ohio car, made by the Ohio Motor Car Company, Cincinnati, O., has been appointed distributor for western Pennsylvania and northern West Virginia. J. H. McClarren is president and general manager.

J. A. Birch, Placerville, El Dorado county, Cal., is building a modern garage to accommodate the large number of tourists who pass through that place.

The New York Auto Exchange, Norfolk, Va., has taken quarters in the Flatiron building, Grant and Charlotte streets. The concern has the agency for the White car, made by the White Company, Cleveland, O.

Green & Swett, Boston, will open a branch house at Manchester, Mass, having taken a lease of the Wonson building on Central street.

The Des Moines Rambler Company, Des Moines, Ia., was formed recently and will handle the Rambler line, manufactured by the Thomas B. Jeffery Company, Kenosha, Wis.

Perkins & Corliss, Gloucester, Mass., has made arrangements for the erection of a modern brick garage on Western avenue. It will be one story, 40 by 92 feet, and the front will be utilized for a show and salesroom.

Adams Bros., Hickman, Ky., has purchased from Hale & Caruthers, the Hickman Motor Works, which concern conducted a garage and machine shop.

The Waterville Motor Company, Waterville, Me., is occupying its new garage which is of brick, steel and concrete, two stories in height and modern in every respect.

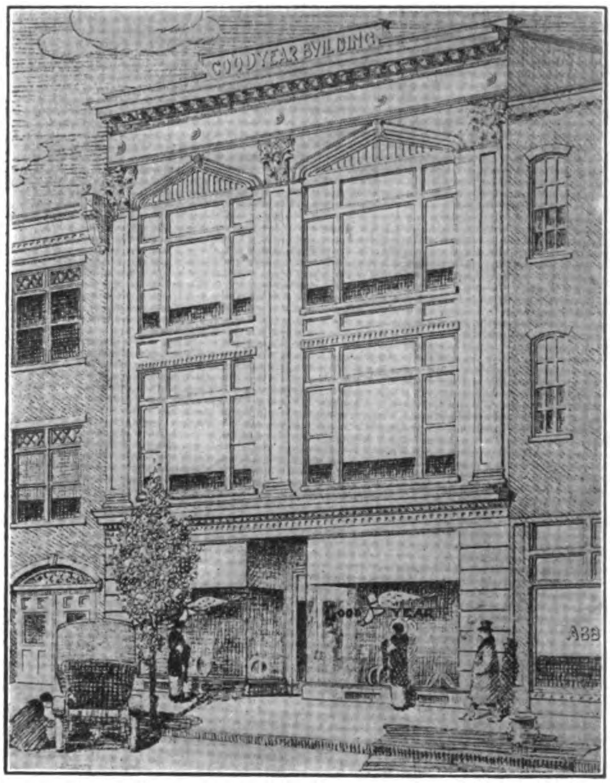
The Burd Auto Company, Waterloo, Ia., moved into its new garage at 420 Seventh street recently. The structure provides 6000 square feet of floor space. New machinery is being installed for a repair shop.

Wilcox Bros., formerly of Chicago, has opened a tire repair shop on Broadway street, Fort Wayne, Ind. The new concern is agent for Fisk tires, made by the Fisk Tire & Rubber Company, Chicopee Falls, Mass.

The Etchells Auto Company, Biddeford, Me., will erect a new garage at Five Points. The building will be one story, 50 by 80 feet, and will contain all modern conveniences. The officers of the company organized recently consist of: President, Arthur L. Roberts; treasurer and manager, Joseph Etchells.

Fred B. Williams has acquired the garage of the Worcester Motor Company, Worcester, Mass., the property consisting of a two-story brick building and 6500 square feet of land.

William S. Mathews and Charles S. Langley have formed a partnership under the firm name of The Mathews & Langley Auto Company and will handle the Abbott-Detroit, made by the Abbott Motor Company, Detroit. The new concern will have as territory, York county, Me.; Strafford county, and Portsmouth and Newmarket in Rockingham county, N. H. Headquarters will be at Somersworth, N. H.



New Home of the Philadelphia Branch of the Goodyear Tire & Rubber Company, Which Is Equipped with Modern Conveniences.

A. L. Alexander, Waterloo, Ia., is planning the erection of a new garage at the corner of Sixth and Franklin streets. It will be two stories, 40 by 80 feet, and will be ready for occupancy in the near future.

Schipper & Block, Peoria, Ill., will build a garage on Fulton street. It will be constructed of fire proof material, two stories in height and will include a fully equipped repair shop.

The Warren Garage Company, Worcester, Mass., has removed to new quarters, having leased the entire building at Vine and Franklin streets.

Jack Payment and Arthur C. Wagner have formed a company which will be known as the Estarado Auto Company and which will represent the Hupmobile in Denver, Col. A service station will be maintained where the owners of the machine made by the Hupp Motor Car Company of Detroit will be served.

Earl Chambers of Danville, Ill., has closed his garage and salesroom and accepted a position with the Chicago branch of the Velie Motor Vehicle Company, Moline, Ill.

WITH THE MANUFACTURER

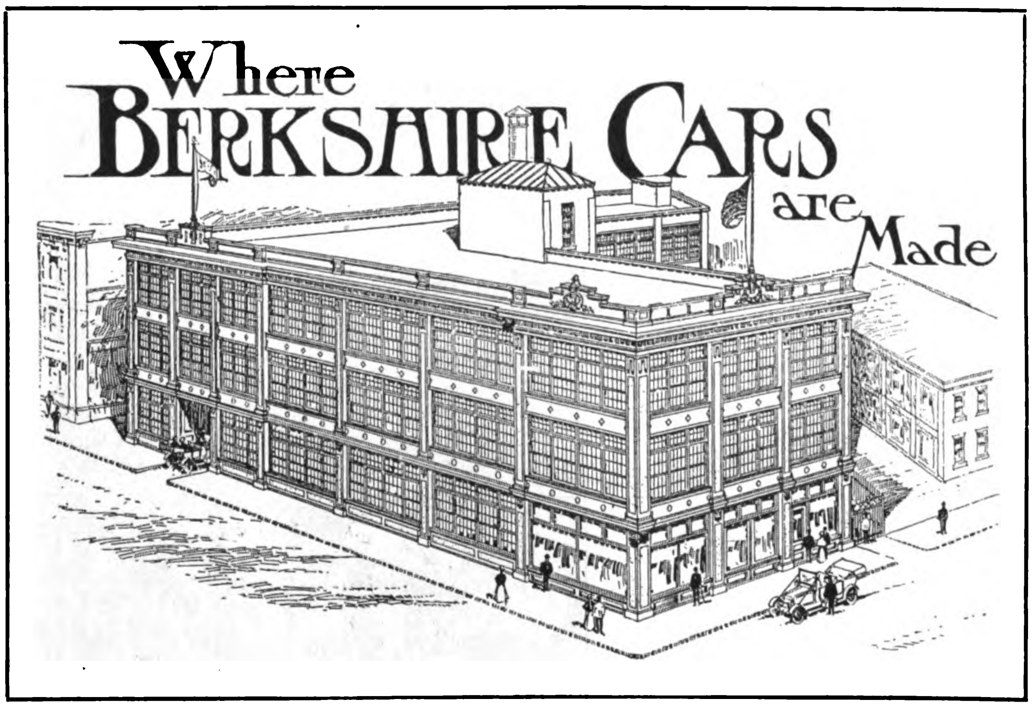
Fred J. Titus, who for the past year has been connected with the retail department of the American Locomotive Company, New York City and Providence, R. I., is now associated with the wholesale department of that company.

The Abbott Motor Company, Detroit, announces the appointment of the following agencies: Missouri Motor Car Company, St. Louis, Mo.; W. D. Rightmire, Duluth, Minn.; D. B. Smith Auto Company, Burlington, Ia.; J. H. Fox, Grand Rapids, Mich.; E. F. Shriver, Benton Harbor, Mich.

Lucius A. French, advertising manager and assistant secretary of the Henderson Motor Sales Company, Indianapolis, Ind., has resigned from that company to become advertising manager for the Eiler Music Houses, and left for Portland, Ore., recently. His many friends tendered him a banquet before his departure.

Edgar E. Muller has been appointed manager of the recently established service department of the Ohio Motor Car Company, Cincinnati, O. Mr. Muller has been connected with the company since its inception.

H. C. Lathrop, secretary and treasurer of the Henderson Motor Sales Company, Indianapolis, Ind., and Miss Julia V. Hyland, a prominent Youngstown, O., society girl, were married in that city recently during the automobile show. They will reside in Indianapolis.



General View of Berkshire Motors Company's New Plant at Cambridge, Mass.

The Lininger Implement Company, Omaha, Neb., announces that its annual automobile accessory catalogue is ready for distribution and copies will be mailed free upon application.

Alden L. MacMurtry has resigned his position with Gray & Davis, Amesbury, Mass., manufacturers of automobile lamps and an electric lighting dynamo. He will devote his entire attention in the future to the Mondex specialties handled by the Aristos Company, New York City.

Nelson S. Riley has been appointed manager of the Kansas City branch of the Studebaker Corporation, Detroit. He was for some time connected with the company's branch at Denver, Col.

The Havoline Oil Company, 17 Battery place, New York City, announces the appointment of new agents as follows: W. A. B. Worley, Jacksonville, Fla., Florida territory; Augusta Overland Motor Car Company, Augusta, Ga., Lincoln, Columbia, Richmond, Warren, Jefferson, Glasscock, Washington and Jenkins counties, Georgia, and Edgefield, Aiken and Barnwell counties in South Carolina; the Euclid Oil Company, 1906 Euclid avenue, Cleveland, O., territory included in northwestern Ohio, Cleveland, Akron and Youngstown; the James Gray Kuhn Company, 5712 Penn avenue, Pittsburg, Penn., for the territory within a radius of 60 miles of that city. The Pittsburg and Cleveland agents exhibited at the motor car shows held recently in those cities.

The Texas Company, New York City, is issuing a neat booklet which tells about motor lubrication and how to remedy oiling troubles.

The Findeisen & Kropf Manufacturing Company, Chicago, announces that the Hall Motor Supplies Company, Toronto, will act as distributor for the Rayfield carburetor in Canada. The R. C. Hull Electric Company of Cleveland, O., will also handle the Rayfield.

The New York Lubricating Oil Company, consolidated with the Columbia Lubricants Company of New York, has found it necessary to open a branch office at Seattle, Wash., at the corner of Virginia and Railroad avenues, owing to the large increase in business on the Pacific Coast. A new and larger warehouse has been secured in Newark at 3739 New Jersey railroad avenue.

D. H. Wetzel, for the past year or more advertising manager of the Ajax-Grieb Rubber Company, has resigned to become advertising and sales manager of the Maple Products Company, Utica, N. Y. He assumed his new duties March 15.

Williams & Co., New England agent for the Cartercar, made by the Cartercar Company, Pontiac, Mich., is occupying new and more commodious salesrooms at 1000 Boylston street, Boston, where a full line of the product of the Pontiac concern will be shown.

The Northwestern Chemical Company, Marietta, O., maker of "The Chemically Correct Line," is mailing its 1912 catalogue of motor car specialties.

The Blood Bros. Machine Company, Kalamazoo, Mich., maker of universal joints, announces the operation of its plant 23 hours a day in order to handle its increased business. During the past six months the company has doubled its plant and even with the additions and special machinery finds it difficult to keep up with its orders.

The Kissel Motor Car Company of Hartford, Wis., has completed negotiations for a new home for its New England branch, and will erect a building 74 by 200 feet on Commonwealth avenue at Pleasant street, Brookline, Mass. When completed it will be one of the finest structures of its kind in New England and will have a salesroom 74 by 70 feet. The garage will occupy the rear of the first floor and the most modern appliances will be installed for the care and maintenance of motor vehicles. Manager H. B. Pruden has provided a room for the chauffeurs direct off the garage. The service shop will be located on the second floor, rear, and the machinery will be operated by electricity. A trolley system will be installed for handling heavy parts, also a large hydraulic elevator. The front portion of this floor wil be utilized for the display of trucks.

The Thomas B. Jeffery Company, Kenosha, Wis., announces that plans have been completed for the erection of the new Rambler sales and service building in the newer Back Bay district of Boston. It will be four stories in height, of fire proof material and will be 216 by 127 feet, providing about 60,000 square feet of floor space. Work has begun upon the Chicago service station which is located at the corner of Indiana avenue and 23rd street. Both properties have been leased for a term of years.

Waverley electrics, made by the Waverley Company, Indianapolis, Ind., and other electric pleasure vehicles were extensively advertised by the dealers in that city recently and the advantages of these machines for city and suburban service emphasized. The campaign had been in progress but a few weeks when the Philadelphia representative of the Waverley Company placed an order for four cars. In the accompanying illustration is depicted the automobiles in front of the salesrooms at 2029 Market street. One of these is a Silent Waverley limousine five-passenger car in which all seats face forward.

Charles A. Trask has resigned as chief engineer of the Cartercar Company, Pontiac, Mich. He was identified with the company for over five years.

The Abbott Motor Company, Detroit, has appointed the following concerns to handle the Abbott-Detroit: D. B. Hoffer & Sons, Reading, Penn.; The Heathman-Solliday Motor Company, Dayton, O.; John Deere Plow Company, Dallas, Tex.; W. S. Bruce & Co., Memphis, Tenn.; Abbott Motor Sales Company, Toledo, O.

The K-R-I-T Motor Car Company, Detroit, maker of K-R-I-T cars, is occupying the two new buildings added recently to the plant, which is depicted in the accompanying illustration. Another building is in the course of construction, which, when completed, will give the company a capacity for an output four times that of 1911.

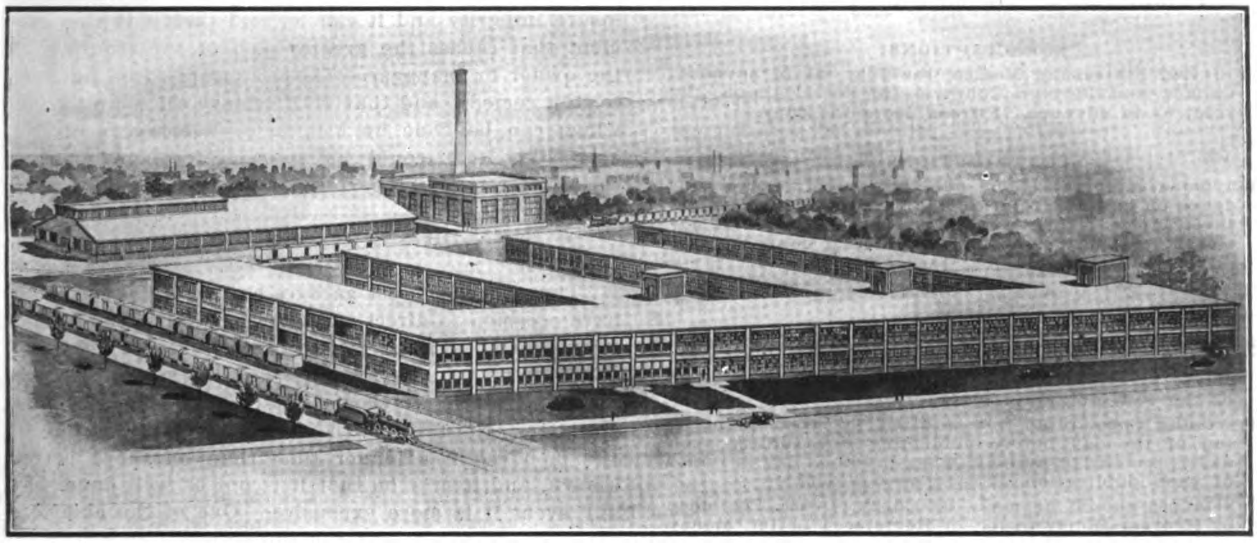
The Findeisen & Kropf Manufacturing Company, Chicago, maker of the Rayfield carburetor, is issuing a booklet describing and illustrating a 3200-mile pathfinding trip undertaken in the interests of the Transcontinental Touring Club of America which took the machine equipped with a Rayfield over what will be known as the Panama-Pacific trail or Southwestern route.

The Stephney Tire & Rubber Company, New York City, is issuing a notice calling attention to its product, also quoting prices of tires and inner tubes.

The Goodyear Tire & Rubber Company, Akron, O., announces that its branch at Birmingham, Ala., is occupying its new quarters at 420-422 South 20th street. The new location is in a two-story building, 48 by 90 feet and constructed on the same lines as all of the Goodyear branches.

O. M. Crawford, formerly manager of the advertising and service departments of the Colby Motor Company, Mason City, Ia., is now with the Zenith Carburetor Company, Detroit.

The Goodyear Tire & Rubber Company's Philadelphia branch is occupying its new home at 207-209 North Broad street which was opened to the public recently. In the accompanying illustration is presented the structure which is three stories in height, and the windows are so distributed that there is an abundance of light. The front of the building is of terra cotta, adding to its attractiveness. In the arrangement of the basement special thought has been given to motor truck tires due to the rapid development of this industry. Spaces are provided for the storage of heavy steel bands, rims and other necessary equipment. The first floor is devoted to the show room, offices, salesrooms, ladies' retiring room, etc. The woodwork is of highly polished oak, as is the furniture and furnishings. An electric lighting system, similar to that utilized at the Chicago branch, is employed for lighting in the evening. To the rear of the salesroom is the adjusting department fully equipped for this work, also a ladies' retiring room for the use of touring customers. The shipping room is at the rear and from it elevators lead to all floors. On the second floor is located the stock room for pleasure car tires, these being carried in the latest design of racks.



Plant of the Gramm Motor Truck Company, Lima, O., the Controlling Interest in Which Was Acquired by John N. Willys, Recently.

The Empire Tire Company, Trenton, N. J., maker of Empire tires, is mailing a novel folder, inasmuch as the cover is so cut that it represents on open door and a machine entering from the road. The inside page shows the car approaching the open door.

The Motz Tire & Rubber Company, Akron, O., maker of Motz tires, announces the appointment of the Standard Tire & Rubber Company, 104-106 Portland street, Boston, as New England agent.

The Havers Motor Car Company, Port Huron, Mich, will be represented by new Havers agents as follows: B. A. & R. Cunningham, Hackensack, N. J.; H. M. Andress & Co., Elyria, O.; Winnipeg Garage, Ltd., Winnipeg, Man.; Coleman Bros. & Dillon, Bedalia, Mo.

The Ford Motor Company, Detroit, entertained another large delegation of Ford dealers recently these agents arriving at Detroit from Grand Rapids, Mich., in a special train. The accompanying illustration shows the visitors, who were escorted to the Hotel Normandie for breakfast after which they visited the factory where groups of 20 were shown through the immense plant. At noon the visitors lunched at the Log Cabin Inn with the executives of the company, and in the afternoon listened to an address by N. A. Hawkins, the commercial manager, afterwards visiting the plant of Dodge Bros. In the evening a banquet was served at which Mr. Hawkins was toastmaster.

The Henderson Motor Sales Company, Indianapolis, Ind., distributor for the Cole car, made by the Cole Motor Car Company of that city, announces the following new agencies: Z. C. McIntire, Montgomery, Ala.; Northern Automobile Agency, Talladega, Ala.; H. C. Dunlap, Napa, Cal.; Patterson Motor Sales Company, Hamilton, Ont., Canada; Fleming & Brown, Kankakee, Ill.; A. L. Alexander, Waterloo, Ia.; E. B. Elliott, Audubon, Ia.; W. F. Peterson, Sibley, Ia.; E. E. Freeman, Oakland, Ia.; C. F. Welmerling, Storm Lake, Ia.; E. D. Blaisdell, Dexter, Me.; Arthur P. Libby, Fort Fairfield, Me.; J. H. Penniman, Kalamazoo, Mich.; Johnson Motor Car Company, Duluth, Minn; J. H. Brown, Eveleth Auto & Repair Company, Eveleth, Minn.; Crescent Garage Company, Ogdensburg, N. Y.; George Leonard, Auburn, N. Y.; C. R. Wise, Watertown, N. Y.; Loyd's Garage, Oneida, N. Y.; Cole Motor Sales Company, Peebles Corner, Cincinnati, O.; C. H. Schubert, Barberton, O.; Ernest K. Hoge, Martins Ferry, O.; G. E. Sullivan, Oregon City, Ore.; Central Garage, Williamsport, Penn.; Chas. E. Barkl, Aberdeen, S. D.; R. L. Holcomb, Rapid City, S. D.

Lucius E. Wilson, former secretary of the Detroit board of trade, has entered upon his new duties as vice president and general manager of the Warren Motor Car Company of that city, maker of Warren cars.

The Cork Insert Company, Boston, is mailing the trade a folder dealing with costs of cork inserts in practise, also a diagram curve of different types of pulleys.

The Pope Manufacturing Company, Hartford, Conn.; is contemplating a four-story addition to its plant, furnishing 60,000 additional square feet of floor space.

The Van Motor Car Company, Grand Haven, Mich., has been purchased by H. M. Pierce, J. A. Owen and Mrs. L. M. Strong of Grand Rapids, Mich. Mrs. Strong is president; M. M. Pierce, vice president, and J. A. Owen, secretary and treasurer. They will build the Pioneer roadster.

The Oakland Motor Car Company, Pontiac, Mich., announces that a branch house will be established at San Francisco, Cal., which will be utilized as a distributing point for Oakland cars in the western territory. A large stock of parts, etc., will be carried and a service department established. Henry L. Hornberger will be manager.

The United States Tire Company, New York City, has opened a state branch at Des Moines, Ia., at 406 West Ninth street. W. H. Mesenbrink, who has represented the company in Iowa and Nebraska for eight years, will manage the branch which will devote its efforts exclusively to the wholesale distribution of the various tires made by the New York concern.

The Standard Woven Fabric Company, Worcester, Mass., maker of Multibestos, has increased its selling branches, having closed with Petry-Cassidy, Inc., 1416 Vine street, Philadelphia, as agent in Pennsylvania and the South, also James G. Barclay, 720 Main street, Buffalo, N. Y., the latter to act as sales agent through central and western New York State.

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CODE OF DRIVING SIGNALS.

The highway traffic is increasing constantly and its volume at times and in certain thoroughfares in communities of considerable proportions is sufficient to congest badly. The progress of the slowest establishes the fastest pace for all. This condition may be regulated by locality regulations. But no municipality or state requires uniform observance of driving signals. There is international recognition of marine signalling. This is for the benefit of all alike. The demands for a code that will afford universal protection for all persons using the roads and streets, no matter whether in vehicles or pedestrians, are immediate and imperative. To establish a universal system of visual and aural warnings of approach and movement, that might be given by equipment now the vogue, or what could be installed at trifing expense, is necessary. In this country there are 48 states, each with different laws and regulations. One would be sufficient and could be better understood and enforced. It is not possible to bring about such a change unless there is unanimity of opinion. No one has a better reason to advocate such a change than one in the industry or trade, and no one can more consistently direct endeavors to bring about a demand for the protection suggested. There must be initiative and there must be unfailing energy and confidence. There is no possibility of reward. Here is opportunity for individuals and bodies of men organized for promotion of pleasure and business to accomplish a very large measure of good. Who could better undertake such a universal public benefit than those interested in a business way?

GARAGE HELP PROBLEM.

The public service station, as does the stable, attracts a class of visitors whose business may be either destructive of time or property or both. That these undesirables appear, however, is largely due to tolerance by the employees, and usually the attention suffers in proportion to the number. There is no assurance that honesty is a predominating quality, and in the absence of anything that might be regarded as establishing direct suspicion there can hardly be the confidence maintained by the customers that would obtain under other conditions. There is a class of labor about garages that is not paid well enough to insure integrity and it can be said that it is this element that causes the greater part of the troubles of the owner or manager. There appears to be but one certain remedy, and that is to remove all temptations, which can be done by locking or keeping record of everything that could be appropriated and making certain a responsibility for those in charge.

EXCHANGE OF EXPERIENCES.

Those who conduct garages and repair shops often have occasion to direct work upon cars practically unknown to them, and while it may be said that the majority of vehicles are the same in general principles, they often differ materially in design and construction. Naturally work on machines unfamiliar to the men requires longer time than on those better known, and it may be that it is not as well done. In any event it is more expensive. One of the chief attractions of the shows for the expert repairer is to perfect a knowledge of every car exhibited, and the more time that can be devoted to this work the better. Beyond this it is desirable that head mechanics exchange their experiences, not for the purpose of discounting constructions or methods, but to benefit each other in the work that each expects to do. The automobile repairer is often discredited because he cannot do with all cars, what he can do with one. The best he can do is to attempt to improve himself, and he can do so through an exchange of experience.

VALUE OF TRADE INFORMATION.

The man who succeeds best knows his business, the possibilities of the market, what his competitors are doing, and takes advantage of opportunities. To refuse knowledge that is absolutely necessary, and can be obtained from dependable sources, is a failure that cannot be justified. Information relating to the industry is indispensable to the buyer, who has the choice of the best the market affords, what is in greatest demand, and can maintain a stock that always commands attention. The man who neglects to study his business possibilities is hopelessly anchored. If he fails it is because he would not do what he could do.

WHO'S WHO IN THE INDUSTRY.

WILLYS ACQUIRES GRAMM PLANT.

A transaction of importance to the automobile industry is announced in the statement that John N. Willys, president and sole owner of the Willys-Overland Company, maker of Overland cars, and allied interests, has purchased the controlling interest in the Gramm Motor Truck Company, Lima, O. The amount of money involved in the deal has not been made public, but it is understood to have been one of the largest transactions of this character in the history of the motor car.

John N. Willys, President Willys-Overland Company.

It has been known for some time that Mr. Willys was casting about for a truck plant which was equipped as he thought it should be to meet the requirements and demands of the commercial car users of America, and particularly with ~~reference~~ to the business arrangements of the more than 2000 Overland dealers throughout the country. The selection of the Gramm plant appears to be in keeping with this desire.

Mr. Willys' success in building up the production of Overland cars since he became identified with that company, is ample assurance that the future of the Gramm truck will be along liberal lines. It is understood there will be no change in the policy of the concern, except in the matter of broader production facilities, and in line with this suggestion, B. A. Gramm, one of the most experienced commercial vehicle manufacturers in the country, will be associated with Mr. Willys in working out the problem.

The Gramm plant is said to be the largest truck factory in the world, devoted exclusively to the manufacture of industrial transports. The buildings are located on 22 acres of ground, and 1200 men are employed. All of the equipment is of the very latest and best to be had, and the automatic machinery is the most modern in design. The buildings are of steel and reinforced concrete, and are valued at $1,250,000.

SUCCESS WITH LENOX CARS.

Few young men have had better success in the sale of automobiles than William Blanchard, who has just been promoted to become sales manager for the Lenox Motor Car Company, 3368 Washington street, Boston, Mass., maker of Lenox cars. He has been associated with this concern less than a year, and during that time has demonstrated his remarkable ability along this line.

Mr. Blanchard has been connected with the motor car industry for the past five years, and has a wide circle of friends and acquaintances, particularly in the New England states. Undoubtedly, a large measure of his success is traceable to this fact, although he possesses personal qualities which make him one of the best salesmen in this district.

William Blanchard, Sales Manager, Lenox Motor Car Company.

Perhaps the greatest secret of all is his thorough familiarity with the construction of an automobile. He gained his rudimentary knowledge of motor cars with the Easton Machine Company, Easton, Mass., maker of the Morse car. Here he worked in every department, serving his full time at the bench and in the shop. It was while acting as salesman for Morse cars that the Lenox company induced him to undertake the exploitation of the Lenox line.

AN ENTERPRISING SHOW MANAGER.

In the face of what was believed to be almost certain failure, Thomas I. Cochran, who was the directing head of the first automobile display ever held in Pittsburg, Penn., was able to rally a large number of the dealers of that city to his aid and succeeded in presenting the most elaborate and artistic display the city has known. It was held in the Exposition building under the auspices of the Pittsburg Automobile Show Association, and despite the fact that some of the local dealers had already held an exhibition, Mr. Cochran's great success appears to have established the fact that the show under his management is considered as the really big event of the year.

Thomas I. Cochran, Manager Pittsburg Exposition Show.

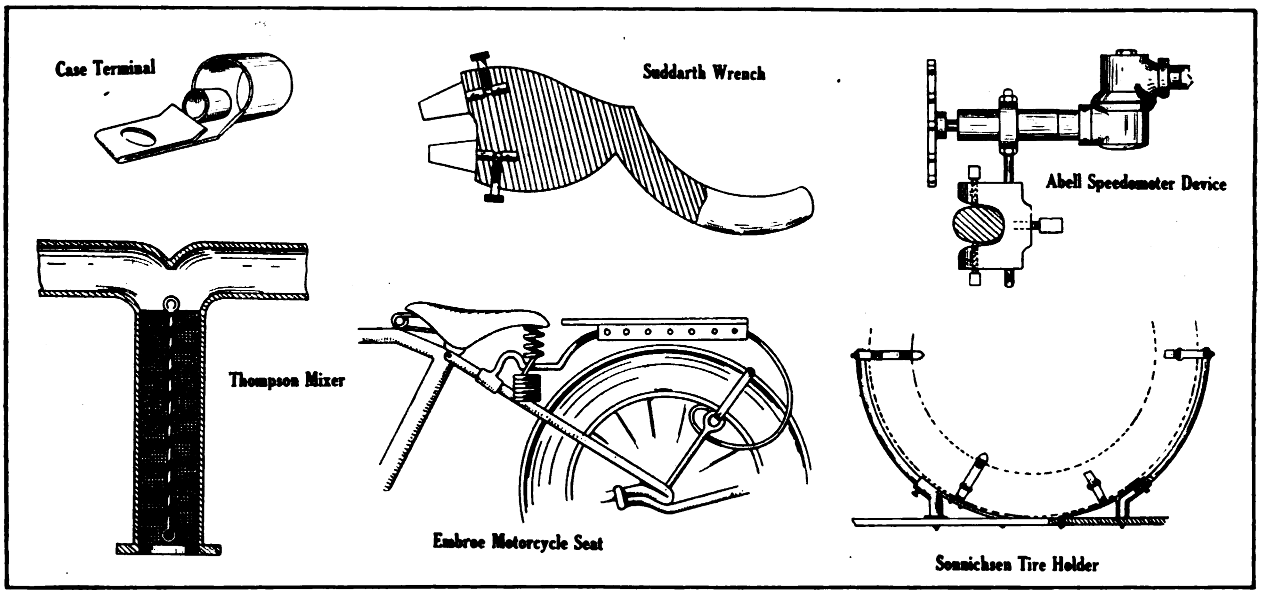
RECENT PATENTS of INTEREST

Case Terminal.

Frank E. Case, Schenectady, N. Y., assignor to the General Electric Company of that city, has been granted a patent for a terminal for electric conductors. It consists of a metal strip having holding clips formed at opposite ends, these being arranged so as to be coaxial and to engage adjacent portions of the conductor. It is stated of the device that the larger clip holds the insulated member securely and that the wire or conductor may be fastened equally as well.

Thompson Mixer.

To secure the greatest efficiency from a hydrocarbon motor it is necessary that the fuel be mixed thoroughly with the atmosphere and in the proper proportions. Sometimes through faulty action of the vaporizer raw gasoline is drawn into the manifold and combustion chamber, impairing action of motor. Frederick Foster Thompson, Lawton, Okla., has been granted a patent for a mixer for gaseous fluids adapted to be inserted in the intake manifold between the carburetor and the combustion chamber. It comprises a tube or cylinder of perforated material and a rod arranged axially of the tube. This rod carries a helical wing or vane of perforated material and this is in contact with the edges of the tube. It is claimed by the inventor that the swirling motion imparted to the mixture drawn in by the suction of the piston breaks up any particles of fluid, and that carburetion is improved thereby.



Some Recent Patents Applicable to the Motor Propelled Vehicle, Including Case Terminal, Suddarth Wrench, Thompson Mixer and Embree Motorcycle Seat.

Suddarth Wrench.

A wrench of which the inventor claims a quick adjustment of the jaws is the subject of a patent issued to Archibald S. Suddarth, Monterey, Va. It consists of a wrench stock having a head provided with deep cylindrical depressions. A pair of revoluble jaws having eccentrically arranged shanks and provided with annular grooves is fitted within the depression. By means of pins fitted through the head of the tool and extending into the grooves of the shank, the jaws are swivelly adjustable. The jaws are rectangular in cross section and taper longitudinally, thereby forming a plurality of nut engaging faces. In practise these jaws are rotated until the desired opening is secured.

Abell Speedometer Support.

Rollin Abell, Boston, has been granted a patent for a supporting device for speedometer driving mechanism. It comprises a split collar having lugs or ears, a threaded rod and a fork shaped block. The collar is clamped over the bearing sleeve of the speedometer driving mechanism and locked securely by nuts. A vertical rod is also locked to this collar and carries a block which is moved up or down as desired in making an adjustment to mesh the driving and driven gears of the speedometer. The block is equipped with three set screws, one of which is utilized to lock the block in position and the other members the knuckle of the wheel.

Embree Motorcycle Carrier.

Many motorcyclists utilize their mounts for carrying packages and at times desire an extra seat when transporting two persons. Clarence J. Embree, Tacoma, Wash., has been granted a patent for a seat and carrier attachment which comprises a fork having its ends secured to the rear axle and having its intermediate portion spanning the rear wheel. Resilient members are incorporated each having one end secured to the fork and the other to the frame of the machine. The seat is equipped with flanges extending downward at the sides of the resilient members and means are provided for resiliently holding the seat in position to permit of slight longitudinal movement on the spring members. Set screws are utilized to fasten the seat securely.

Sonnichsen Tire Holder.

Some motorists object to attaching tire holders to the body of the machine, preferring to carry the extra casings on the running board. Andreas M. Sonnichsen, Milwaukee, Wis., assignor to the Auto Parts Manufacturing Company, has invented a tire holder of the running board type, which is so constructed that it may be adjusted to accommodate different sized shoes. It comprises a pair of independent tubular curved brackets, these being fitted with extensions for the purpose of fastening securely to the running board. Extensions are fitted into these supporting members and means are incorporated for securing the parts. The curved brackets are moved toward or away from each other to accommodate tires of different diameter and are fitted with curved members for the purpose of fastening the shoes thereto.

Hand Starting Device.

Considerable attention is being given to the matter of starting the gasoline engine and the forms of mechanism to do this work have been many and various. That a large number of them have been brought out will not be disputed, or the fact that not all are practicable. In the device under consideration here and shown in the sketch on this page, the inventor has restricted himself to a detail; that of arranging a lever and a ratchet so as to avoid any kick-back on the operator.

In doing this two ratchets have been necessary, one slightly curved, the other a full wheel, and each with its pawl. One of these is attached to the grip of the lever by means of a push button for releasing it, while the other is normally held in position by a spring. The general scheme for a lever arrangement which could be placed on an extension of the main quadrant at the driver's right hand so as to operate from the seat is a good one. It is the invention of Robert McKee, Philadelphia, Penn.

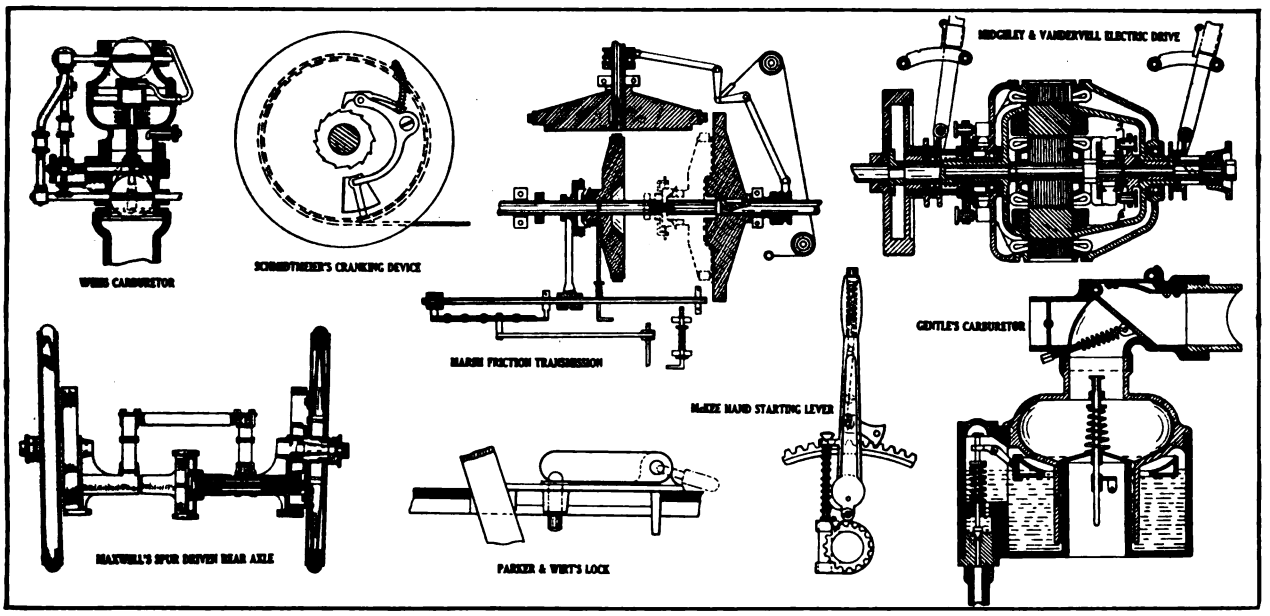
Carburetor with Peculiar Feed.

In his new carbureting device, Arthur J. Weiss, West Orange, N. J., patent 993,210, has departed considerably from the conventional, in a few respects at least. First there does not seem to be any float, the fuel supply being governed by means of the usual needle valve and spraying nozzle combined in one and worked by means of a piston, upon which the suction operates.

A heavy draft would pull this upward and open the fuel aperture wide admitting much gasoline, while a small draft would not open it as much. Vibration back and forth is prevented by means of a large diameter spring, while the upper end of the piston shaft carries a small piston, which works in a secondary cylinder to which gas is admitted by means of a bypass from the main pipe beyond the throttle. This would equalize the pressure on each side of the throttle, and assist in steady, regular action. In addition, the auxiliary air inlet comprises a series of radial slots, tapering from the inlet down to a small opening. Each of these leads to the fuel distributor in the mixing chamber, the connection being by means of a radially slotted body, the slots of which communicate with the fuel inlet passage. If the devices incorporated in this invention will do the work, the inventor will have simplified carburetors very markedly.

New Form of Automobile Lock.

Among the number of motor car locks, recently patented in this country, there is shown in the sketch herewith, a novel form. This is the invention of two Philadelphia men, Charles R. Parker and Reuben D. Wirt, patent 992,444, the same having been assigned to the General Utility Company, of the same city. This consists of a flat base, with projections which would go into the usual quadrant bars, and means for holding the levers, while a projection above matches a loop added to the quadrant so that a lock may be slipped through both, thus holding them together firmly. It is removed by unlocking and taking off the padlock, when the entire plate can be lifted out.


WEISS CARBURETOR
SCHMIDTHEISER'S CRANKING DEVICE
MARSH FRICTION TRANSMISSION
MIDGLEY & VANDERVELL ELECTRIC DRIVE
GENTLE'S CARBURETOR
McKEE HAND STARTING LEVER
MAXWELL'S SPUR DRIVEN REAR AXLE
PARKER & WIRTS LOCK

Interesting Patents Connected Primarily with the Automobile, Including Carburetors, Starting Devices, New Forms of Transmissions, Lock and Rear Axle Arrangement.

Gentle's Carburetor Form.

Another new idea in the way of carburetors is that of William M. Gentle, Greenwood, Ind., patent 993,516, in which a very slight difference is noted. This consists, as the sketch shows, of an auxiliary air valve operated by the suction of the pistons, and thus, automatically. It is, comparatively speaking, non-adjustable. A swinging flap valve is placed in the manifold just above the vaporizer and directly behind the throttle valve, which is retained on its seat by means of a light spring capable of being varied slightly by an external screw. A strong suction would, through the shape of the pipes, draw this flap open and admit additional air to dilute the mixture, which is apparently the object of the inventor.

Electric Driving Arrangement for Autos.

Since the automobile was first brought out, inventors everywhere have been trying to apply the high starting torque and other big advantages of the electric motor to the motor car. The latest in this line is shown in a sketch herewith, being the product of two Englishmen, A. H. Midgeley and C. A. Vandervell, patent 993,611, the latter the well known ignition specialist. This consists primarily of a dynamo armature, a motor armature and a common field, the latter being placed around the dynamo, while the motor surrounds it. There is in addition a means for moving the field magnets laterally, as well as separate excitation, while the wiring provides for the usual connections of motor with dynamo for high speed driving, when the whole is locked together and rotates as a unit. An unusual feature is noted in the mechanical clutch—a cone of good size—used for connecting and disconnecting the electrical outfit with the engine shaft. In addition, a purely mechanical drive, straight through, is provided for.

Schmidtmeier's Cranking Arrangement.

This arrangement of parts here is such that the engine power is used to wind up a spring, which is ratchet retained, although a pulley is provided by means of which power could be stored in the spring from another source. It is the invention of Joseph A. Schmidtmeier, Pendleton, Ore., and the patent, 993,885, concerns itself mainly with the details of the ratchet arrangement, little or nothing being said about the spring or other source of power.

In the ratchet device, as the drawing shows, there is a pawl pivotally mounted upon a lever with a small coil spring to hold it into engagement. It would not, however, touch the ratchet regardless of the spring except when the lever is pulled back by a lever and rod connection. This the driver is intended to operate, the arrangement being such that a pull on the connecting rod would throw it into engagement. The engine or other source of power would then wind the spring, leaving it ready for use. This would be the case, until the operator again pulled the lever which operated the entire device, when the pawl would be pulled out of mesh, and the spring would begin to unwind and turn the engine over.

Friction Form of Transmission.

In the substitute for a gearbox, invented by E. S. Marsh and R. M. Marsh, Rochester, N. Y., and upon which they have been granted patent 994,017, three friction discs are employed. Two are parallel, while the third sets at right angles being arranged to contact with the face of one and the periphery of the other. The mainshaft carries the two wheels, being broken in the centre, and having one wheel fixed to one part and the other keyed so as to slide upon the other. The third member is an intermediate wheel, being designed to drive off the face of the first rotator, and upon the periphery of the third.

By moving the latter across the face of the intermediate, the variation in speeds is gained, the first and intermediate connection resulting in a single speed. Arrangement is also made for throwing the intermediate wheel out of engagement, at which time the final member may be engaged with the first of the series by a clutch face machined on both, thus providing a direct drive. Besides being direct, this would be a strictly mechanical connection as compared with the frictional contact of the others.

Spur Gear Final Drive.

In the rear axle driving arrangement, upon which patent 994,019 has been granted J. D. Maxwell, Tarrytown, N. Y., internal external spur gears are used. This is a form of final drive which is attracting considerable attention. In the Maxwell arrangement, the usual shaft driven rear axle is carried lower down than is the ordinary case. Upon the ends, a pair of spur gears of small size is carried, these meshing upon the bottom side with a pair of similar spur members, but of larger size mounted upon the two rear wheels.

METHOD OF LACING BELTS.

In punching a belt for lacing, use an oval tool, the longer diameter being parallel with the sides of the belt. Make two rows of holes in each end, placed zigzag. In a three-inch belt there should be four holes in each end, two in each row. In a six-inch member, seven, four in the row nearest the end. A 10-inch belt should have nine holes, and the edge of these should not come any nearer than .75 inch from the sides, or .875 inch from the ends of the belt. The second row should be at least 1.75 inches from the end. On wide belts these distances should be even greater. Begin to lace in the centre of the belt and take care to keep the ends exactly in line, and to lace both sides with equal tightness. The lacing should not be crossed on the side of the belt which runs next to the pulley. In taking up belts, observe the same rules as in putting on new ones.

IRON AND STEEL TEST.

To ascertain whether a pipe is made of iron or steel, cut off a short piece and suspend it in a solution of nine parts of water, three of sulphuric acid, and one of hydrochloric acid, in a porcelain or glass vessel in such way that the end will not touch the bottom of the dish. After two or three hours' immersion remove the part and wash off the acid. If the pipe be steel it will present a bright, solid, unbroken surface. If of iron it will show faint ridges or rings, denoting the different layers of iron and streaks of cinder. In order that the scratches of the cutting tool may not be mistaken for the cinder marks, file the end of the pipe across or grind with an emery wheel until the marks are obliterated.

PROPER USE OF BELT DRESSINGS.

Belt authorities do not recommend the use of dressings unless the member becomes dry and husky. Under these conditions they are applicable. A good material to apply is beef tallow at blood warm temperature and dried by either artificial heat or the sun. The addition of beeswax is suggested if the belts are to be used in wet and damp places. Belts should not be soaked in water before oiling, and penetrating lubricants are not recommended except occasionally when the member is very dry.

CLEANING OILING SYSTEM.

When cleaning the strainer in the oiling system it is well to include the reservoir and all piping. More or less foreign matter will collect and cause clogging in this vital part of the motor's mechanism.

To Anneal High-Speed Steel—High-speed steel is annealed by heating, not by cooling. It does not require more than 12 hours for a piece 2.5 by 10 inches to cool. There are a great many ways in which this steel can be annealed. In place of a crucible use a cast iron box and some cast iron shavings from a planer or lathe, and pack your work in this. If you have not the shavings or box, take a gas pipe and pack the work in charcoal or ashes, dirt, clay, anything that will not burn on the work to be annealed. Heat it for seven hours, running the heat as high as 800 degrees C.; hold the heat at this degree at least five hours, then raise it to 900 degrees C. (cherry red); then shut off your fire and close your furnace door. Take out the steel after 12 hours. Steel treated in this way will be as soft as machine steel.

Emery Sticks Useful—To make emery sticks take a piece of pine, or other wood, about the size and shape of a file. Glue a piece of emery paper or cloth on, and after dry, use the same as a file. Sandpaper can be used the same way for work on wood.

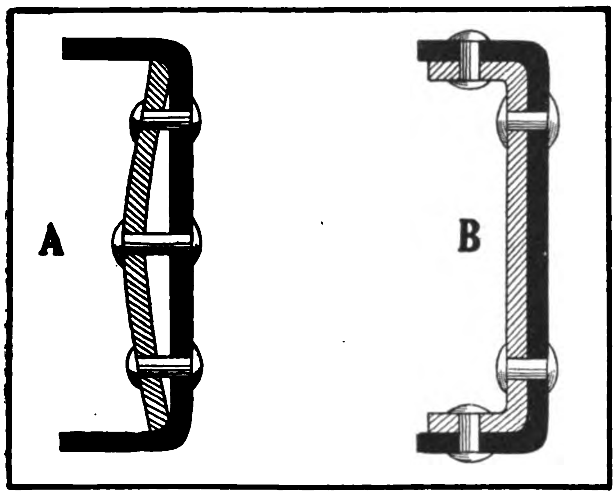
CORRESPONDENCE ON MECHANICAL SUBJECTS.

Strengthening Frame Members.

(58)—I have a weak spot in one of the side members of my automobile frame, and wish to strengthen it, as I cannot afford a new frame at this time, even if the car were worth it, which I doubt. Will you assist in this by giving me some advice on materials and methods of making such repairs? It is of the channel section, with open side in, about .125 inch thick at the point in question and is called in the catalogue "pressed steel."

J. W. DAWSON.

Bay City, Mich., April 1.



Improper and Correct Methods of Strengthening Weak Frame Side Members, Shown at A and B, Respectively.

The writer does not give any idea of where the weak spot comes in the length of the frame, or what is the duty of the member at that point. Obviously, this would be more dangerous at an engine or transmission support than elsewhere and a fracture or bend there should be strengthened with more care and the use of heavier materials than otherwise. It is necessary, therefore, in answering this query to assume a general case.

A channel section member of this character can be made stronger in one of three ways. A plate may be added outside, fitted into the inside, or both. As a fourth alternative, the piece can be broken clear through and then welded by means of the oxy-acetylene process, which does not require taking the machine apart, and would result in a stronger section than before.

Leaving aside the last method, the addition of a plate on the outside may prove unsightly, and for strength is more or less dependent upon the bolts or rivets used, being inferior in this respect to the other ways. The same objection doubtless would apply to the third method, a combination of inside and outside plates. This leaves but the second, an inside reinforcement. When properly worked out, this is the best and results in the greatest strength for the repaired section.

A sketch herewith shows two common methods, a correct and an erroneous one. The latter is that at A, where a fairly wide, flat plate, slightly greater in height than the inside distance between the upper and lower flanges of the channel, is driven into place and then bolted or riveted through. This method is wrong for two reasons; the main frame gains little strength from the plate and a small amount from the fastenings, while the mounting is such as to put into these longitudinal stresses which will break them in time without considering any external strains. In the second place, the fillet in the corners of the channel make the accurate fitting of such a plate a very tedious job, so that usually a compromise is accepted and the inner strengthening member driven in.

The repair plan outlined at B, however, is a good one. In this, a wide sheet of fairly thick metal is forged to channel shape so as to fit the inside of the frame closely; in fact, tight enough for a slight drive when assembling. It is then riveted or bolted, not only at the sides as before, but also at the top and bottom. These lend much stiffness and strength, while the positions of the holding bolts or rivets will not allow of any shifting or changing of the relations. It is not much slower to make than the former, will give considerable more strength and last many times as long. If the weak spot is not over one inch wide a 10-inch plate will do, but if the threatening zone is wider than this, it would be advisable to use greater lengths from 15 inches upward, according to the conditions.

Combination Spark and Mixture Trouble.

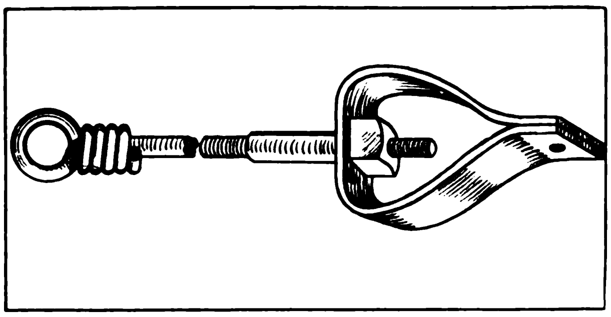
(59)—Kindly advise me concerning some puzzling troubles which I have had lately with my car. I think the fault lies in the carburetor. The car is an ——— with a ——— vaporizer and an ——— magneto. Everything works fine when the throttle is opened one-third and the vehicle running at 15 to 20 miles an hour, but in climbing a hill where the throttle lever is pulled down, the engine will not fire more than two-thirds of the time. As soon as the fuel controlling lever is put back to its former position, the motor fires regularly. If the car is run for five or 10 minutes so as to get the water heated up before starting out everything acts better. It also works much more satisfactorily at night. I have gone over the plugs and find the spark O. K. In my opinion, if this were not true, the motor would miss all of the time. I have tried every possible way of adjusting the carburetor, but this gives worse results rather than better. As soon as the adjustment is changed and the throttle opened, the engine chokes. Is the mixture too rich when it does that, and what is the remedy? Do you think that the trouble can be in the float being too high or low? What are the three different adjusting parts on the carburetor for? It may be that I do not understand these properly.

E. H. SCHOMAKER.

Newawka, Penn., March 15.

If the writer of the above letter can be absolutely certain that his ignition is right, as to quality, quantity and position, the fault lies in the auxiliary air valve. The mere fact that the spark plugs look good, and give a fair spark in the open air does not prove that they do the same within the combustion chamber where the pressure is much higher. It is often the case that an unsuspected small item in the ignition system proves very important in running the motor. If it were not that the writer above is so certain that the trouble lies within the fuel supply group, it would be suggested that the ignition be investigated more thoroughly.

From the description of the peculiar actions, it would appear that the throttle is set to give too rich a mixture when wide open. This means that the rod is connected wrong, the air valve is not adjusted right, or both.



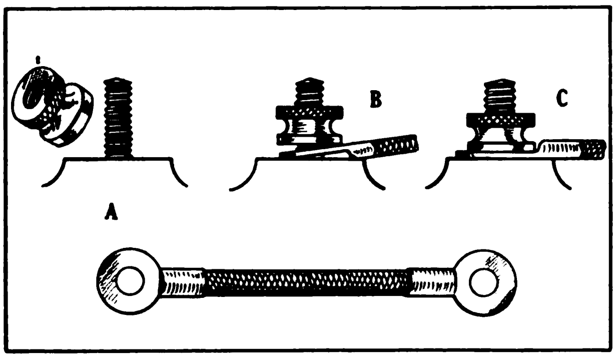
Simple Aeroplane Brace Construction Which Can Be Made from Bicycle Spoke or Piano Wire.

If the first were the case; that is, if the rod were so short that when apparently set at the "closed" position on the steering wheel the butterfly really would be only partially closed, this would result in a wide opening when the quadrant showed half of this. Finally, when the lever was moved to the extreme position indicated, the throttle actually would be closing.

Too little air results in an over-rich mixture, which will not burn as rapidly as a thinner one. Consequently this cannot be used at high speeds, and nearly all carburetors are adjusted to give a much larger quantity of air at those rates, in order to provide a mixture which will burn quickly. A good plan for adjustment is to manipulate the gasoline needle for slow speeds and the air valve for high. In carrying this out on the car, set the throttle nearly closed, and turn the needle in both directions, first one and then the other, until that is found which will permit of the slowest rate of turning over. Continue in this direction to the limit. Then lock the needle in that place.

The result of this will be that the engine will always have sufficient fuel supplied to it for the slowest possible speeds, while at higher rates, the increased suction and the necessity for a larger proportion of air will take care of itself. Then open the throttle wide, and gradually loosen the air valve spring adjustment to give the highest rate of rotation. Do not rely upon the ear in this, when it is almost satisfactory, but apply a speed counter. Turn the adjusting nut to permit more and more air to enter until the maximum speed is reached. When this has been done, lock it in position.

With a multiple carburetor, or a device with more than one standpipe, the remedy is more complicated, for there is a needle and an air valve for each nozzle. While this is more difficult in working out, the principle is the same; gasoline adjustment for slowest rotation, and air opening for highest speed.



Sketch Showing Parts of Battery Connection, Improper and Proper Methods of Using Them.

Connecting Battery Wires Correctly.

(60)—Will you please tell me about connecting terminals to dry cells. Several of us have had an argument over this matter, some claiming that there is a right and wrong method, while others say that there is no wrong method, anything being satisfactory. One claims that wire terminals are so constructed as to be fool proof, and that being the case, it is impossible to put them on incorrectly.

J. W. RILEY.

Belfast, Me., April 2.

Although wire terminals are in a sense fool proof, in that they may be put on either side up, as the accompanying sketch depicts, there is one side which should be used in preference to the other. The idea of a terminal is to make an electrical connection, and that one is best or is connected best which makes the most perfect contact.

The usual terminals have one flat side and another on which the ends are wrapped around the wire tip, thus forming the complete connector. Obviously, this must make a hump at the end of the upper surface of the tip, perhaps .125 inch in height. If this upper side be laid down on top of the battery terminal and the binding nut screwed down on it, the hump will prevent close contact. In fact, as B of the sketch shows, the terminal will bear in but two places, one on the upper surface where the nut touches it, and one on the lower side where it touches the surface of the battery.

Comparing this with C of the drawing, this being a correct connection, the difference can be seen at once. Here the terminal makes a contact all around, touching evenly on all sides, so that the electrical connection is as perfect as is possible to make it. This is the answer to the question: While there is no right and wrong way, the flat surface against the battery as in C of the accompanying sketch is the best and most economical method.

Building an Aeroplane.

(61)—I am building or preparing to construct an aeroplane and would like to have some assistance from you in the details. First, how is it that the form of rotating engine known abroad as the Gnome does not seem to have any carburetor or inlet connections to the combustion chamber?' Second, do you possess any of the dimensions of these motors, not only the bore, stroke, and power developed, but others? Third, are there many triplanes now made, and if not why? Fourth, which is the best form, monoplane, biplane or triplane? Fifth, what would be the best form to model after, my facilities for doing the work being somewhat limited as well as means? Sixth, suggest a simple and very cheap form of connection for brace wires, one that could be made at home. Any other information on aeroplane details will be very welcome.

H. G. DAVIS.

Stamford, Conn., March 16.

The Gnome engine does not have an external but an internal fuel connection, the carburetor being attached to one end of the hollow crankshaft. Through this, the fuel is drawn into the crankcase, then up through the centre of the cylinders, to the pistons. In the head of each of the latter is placed a suction inlet valve, which opens on the down-stroke, permitting the mixture to flow through into the combustion chamber, be compressed on the return or up-stroke, and then fired. A sketch on the opposite page shows the Gnome, gamma type, this being lettered according to the Greek alphabet. This has a bore and stroke of 138 by 120 mm (5.43 by 4.72 inches) and develops 70 horsepower at 1200 revolutions. There are seven cylinders, and the magneto, hidden behind the oil pump, is run at a rate of four-sevenths of the crankshaft speed.

This engine ready for use, weighs 83 kilograms (183 pounds), so its output is one horsepower for every 2.6 pounds. The fuel consumption is said to be but 270 grammes a horsepower-hour, or .085 gallon (on the basis of a gallon weighing seven pounds). This is 5.95 gallons an hour for the full power development, so that a 25-gallon tank would last but 4.2 hours.

The American-made rotating aviation motors are as follows:

Name	Cylinders	Bore	Stroke	Power
Adams-Farwell	5	6.00	6.00	72
A-M	7	3.50	3.50	35
A-M (two cycle).......	6	2.75	2.75	29
Avis (two cycle).......	2	5.50	5.00	30
Gyro	7	4.25	4.75	50
Indian	7	4.37	4.87	53
Macomber	7	4.25	4.25	50
Metz	7	3.50	3.50	34
Metz	7	4.50	4.50	57
Metz	7	6.68	6.75	126
Rotary	7	3.50	3.50	34
Rotary	7	4.25	4.25	50
Rotary	7	4.75	4.62	63
Rotary	14	4.25	4.25	101
Stenzy	2	4.00	4.00	13
Stenzy	2	4.00	5.00	13
Stenzy	4	5.00	5.00	40

Few triplanes have been built, although two new models recently have made their appearance in France. The best known construction of this type was the Roe in England, but this concern has abandoned the three-plane surface in favor of the two. Experiments along this line have not been sufficient to enable a decided opinion as to their ultimate practicability.

The biplane generally is considered as more stable in high winds, while the single surface machine has much more speed. Otherwise there is little to choose between them, although the monoplane is more simple to construct, and as a suggestion, a Bleriot type XI, two bis, might be copied.

Sketch on an accompanying page shows an excellent connection which may be made from old bicycle spokes or piano wire by bending one end and threading the other.

The bent end is wound around a circular member or spar, while the threaded portion passes through a flat plate bent to form a loop, and with one end bored to pass over a bolt, or rest between two connecting parts of the framework. Anyone can make these from strong wire, and their application is particularly simple.

Mixing Fuels and Enriching Gasoline.

(62)—Can you please tell me in what proportions do they mix ether with gasoline to enrich it and get more power from an engine when racing? (2)—Is this injurious to the engine? (3)—Is there any danger of an explosion while mixing the two? (4)—Could I by mixing gasoline and kerosene in equal proportions get satisfactory results from a ——— carburetor?

J. W. L. DE KOVEN.

Bridgeport, Conn., March 14.

It is not advisable to mix fuels, either ether with gasoline, making the latter more explosive, or kerosene with gasoline for the sake of making a cheaper fuel. The former is objectionable as both unnecessary and dangerous, while the latter serves no useful purpose either, rendering a good fuel, gasoline, useless under the usual conditions, so that the gasoline and kerosene are both actually wasted. There are better methods of utilizing cheap fuels than mixing as above.

To answer the above questions in order: (1)—Ether is an oxygen carrier, which is the reason for its use, gasoline rapidly consumed requiring an immense amount of oxygen. There is no general rule for mixing, since this practise is seldom if ever used, newspaper reports to the contrary. Tanks of pure oxygen gas are sometimes carried on racing cars and used. In this case, the sounds which the engine makes, its speed, the color and character of the exhaust, all help to determine the amount to feed into the carburetor system.

(2)—To a certain extent, ether, oxygen, picric acid and similar oxygen carriers injure the engine by subjecting bearings, cranks and all other moving parts to unusual strains for which they were not designed. In addition, picric acid is said to form a deposit on the walls, which will attack the glaze and eat into the metal. Both picric and ether would doubtless cause trouble at the valves first of all, attacking the seats.

(3)—There is no danger of spontaneous combustion or an explosion due to the act of mixing, if that is what is meant, but the higher explosive nature of the compound fuel makes it more difficult to handle, the presence of lights is more dangerous, and in many more ways, the mixture must be handled much more carefully.

(4)—Practically all of the modern carburetor makers claim that the device made by them will run on kerosene without change of adjustment. Heat is necessary in vaporizing kerosene, much more than in vaporizing gasoline. Moreover, the proportion of air to fuel is much different in the two cases, or in the third case of a mixture of equal parts of both. This would necessitate as a minimum requirement, the resetting of the air valve, the resetting of the gasoline or fuel nozzle, as well as a positive source of heat, if your model carburetor does not have a water jacket. Moreover, an engine runs differently on the two fuels. The mixing is not advisable. If you will use kerosene, use two carburetors and two tanks of fuel, one tank and one carburetor with its individual setting for each fuel.

Compression Space and Pressure.

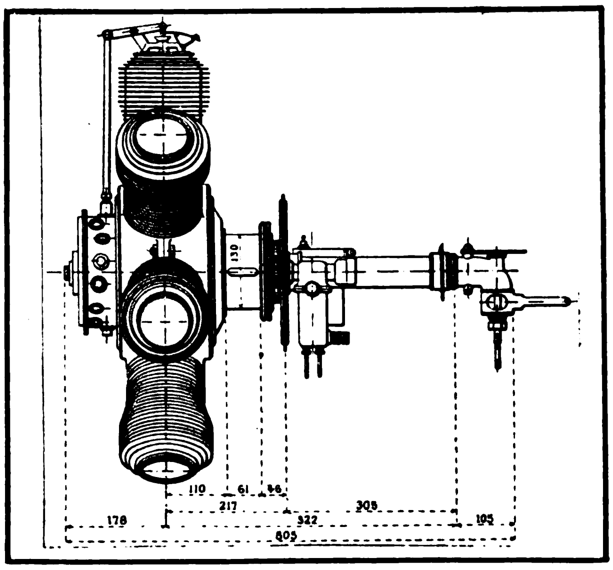
(63)—I have a question which I wish you would please answer. My engine is of four-inch bore and stroke with a 2.75-inch compression chamber, which I think too large to get the power out of the engine. Will you kindly advise the proper distance it should be from the piston head at upper dead centre? About what weight of flywheel should be used on this engine to get full power out of it?

C. I. HISCOX.

Hartford, Conn., March 28.

The information given is not sufficient to allow a definite statement as to whether the compression is correct or not, and if not how much the space should be increased or decreased to correct it. If the valves are in the head, the area of the bore times the height given would give the final space into which the charge is compressed, while this plus the volume swept out by the piston would give the total volume before compression. The ratio of the two would be the ratio of the compression and would determine the actual pressure obtained.

On the other hand, if the valves were in a pocket on one side this would add a certain volume amounting to perhaps 15 per cent. of the final volume, while if the valves were on opposite sides, a much greater amount would be added. If the cylinder head were domed, this would make the volume less in each case, as the measurement given was for the centre point.



Seven-Cylinder Gnome Rotating Aviation Engine, with Dimensions in Millimeters, Showing Carburetor Connection and Oil Pump.

The best way is to measure the amount of the space in water, so as to get it exactly. To do this, make a box which is exactly square, say either three or four inches on each side. Then, the depth of the water in this can be measured, and from it the exact volume computed. The water should be put into the cylinder and added a little bit at a time, so as not to pour in more than the right amount.

Flywheel sizes and weights vary greatly with different makers, different types of engines, different sizes of the same type, and otherwise. A small number of cylinders, as one or two, calls for heavier weight than a larger number, as four or six, while an eight-cylinder requires still less. Speaking of four-cylinder engines, about 10 pounds a horsepower are required up to 12 horsepower, 7.5 pounds from 12 to 20; five pounds from 20 to 30; four pounds from 30 to 40, and so on.

Iron or steel may be made rustproof by boiling in one gallon of water to which is added four ounces of phosphoric acid and one ounce of iron filings.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

ELIMINATING TAPPET NOISE.

There is a growing tendency to enclose the valve tappets and springs and this practise is not confined alone to the high priced automobile. This not only makes for a quiet running motor, but the life of the mechanism is lengthened considerably by being protected from the dust and dirt of the road which is attracted by the oil covered members.

While many modern motors are designed so that a removable plate may be fitted there are numerous old engines which are giving good service although the tappets are more or less noisy. At Fig. 1 is presented a suggestion for eliminating noise as well as providing protection from foreign elements.

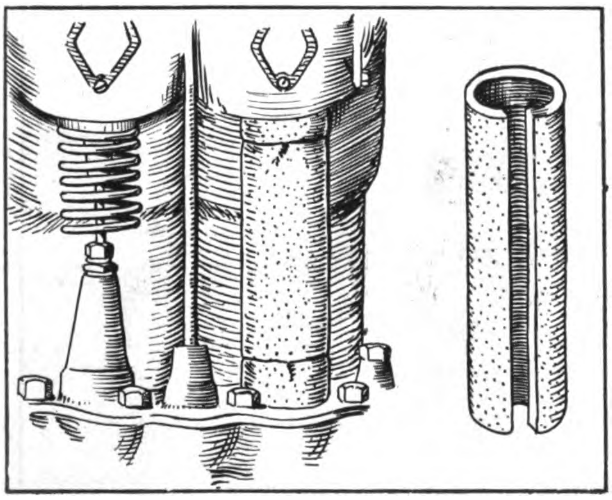


Fig. 1—Suggestion for Quieting Noisy Action of Valve Tappets.

It consists of a piece of rubber tubing fitted around the tappet and valve spring and when properly attached will reduce noisy action of the members to a minimum. With a motor such as depicted in the drawing it is an easy matter to fit the device. The tubing should be larger than the diameter of the valve spring and is cut as shown in the sketch. It is then wired or taped so the edges are drawn together tightly.

In fitting the hose, should the valve springs be larger or the same in diameter as the base of the tappet housing, this and the upper seat of the spring may be enlarged with a washer made from a smaller tubing, and a hose of greater inside dimension employed to cover the extensions. In fitting these devices care should be taken to use a heavy grade of piping with its inside diameter large enough to allow the spring to move freely and without coming in contact with the walls of the tubing.

REMEDYING LEAKY VALVE TAPPETS.

It is very unpleasant after lifting the hood to make a minor adjustment to the motor to discover that the latter is literally covered with dirty oil which has worked past the valve tappet guides and the tappets. It is even more disagreeable if the operator be not equipped with an old coat or arm protectors in the failure of which good clothes often are spoiled.

Two conditions are responsible for the presence of dirty lubricant, and these are more common with old motors or those which have been in service for some time without attention having been given to the valve operating mechanism. When a, motor is new and the rings and pistons are fitted properly there is little compression in the crankcase of the four-cycle type. In time the rings wear, especially if the lubrication system has not performed its function properly or the operator has been careless as to the quantity and quality of oil.

When these conditions exist the compression on the up-stroke of the piston leaks past the rings and pressure is created in the crankcase, the amount depending upon the fit of the rings, etc. It is obvious that even with a small amount being forced into the crankcase at every stroke of the piston, it takes but a short time for the pressure to rise and some of this must escape. If the lower half of the crankcase be fitted snugly, the oil will find its way where the resistance is the least and this may be between the valve guides and the tappets if worn, or around the end bearings of the crankshaft.

Fitting of Breather Pipes.

In modern motors provision is made for the crankcase compression by fitting breathers or standpipes. These consist of open pipes leading into the crankcase, extending vertically and being several inches in height. The top of these members, and usually more than one is fitted, is covered with a fine mesh screen to keep out foreign elements. Not only do the breathers relieve excess compression in the crankcase but they are utilized in replenishing the supply of lubricant in the crankcase and in introducing kerosene when this requires cleaning.

When the valve tappet guides and tappets are worn, and no method incorporated for relieving the compression in the crankcase, the lubricant will be forced out and it is impossible to keep the valve side of the motor clean. Even the fitting of breathers will not wholly eliminate the trouble, nor will cutting down the supply of lubricant effect a cure.

New Members Expensive.

The proper method is to replace the worn members with new parts and with a four-cylinder motor this means eight valve tappet guides and a like number of tappets, incurring considerable expense, the amount depending upon the design. The worn parts could be removed and new guides turned out, but the cost of machining and fitting in some cases probably would not warrant the expenditure.

Leaky members may be cured or conditions bettered by relieving the crankcase compression with breathers if the motor be not thus equipped. At Fig. 2 D is shown an inexpensive breather applicable to a motor, the design of which will not permit the use of a vertical member. That referred to consists of two pieces of brass piping having both ends threaded, an elbow and a cup shaped member. These may be procured at any wholesale plumbing shop and are not expensive. The inside diameter of the pipes should not be less than .375 inch, this depending upon the size of the motor, etc.

A hole is drilled in the crankcase and tapped, and the parts assembled as shown. The cup shaped member should be fitted with a screen and this may be soldered. It should screw up snugly but fit so that it may be removed easily when desired. The number of breathers will depend upon the motor. Some makers fit one large member while instances of four of these devices are noted.

Supplying Grooved Members.

At Fig. 2 is depicted several methods of remedying leaky valve tappet guides and tappets. That at A consists of cutting vertical grooves in the tappet. The object of these is to provide a passage for the oil that works up to return to the crankcase. At B is shown a circumferential groove, this being about .125 inch deep. Connecting with this are two grooves, one on either side, and these lead to the bottom of the tappet. Any oil working up will gather in the larger recess and find its way back into the crankcase. At C is outlined a method of cutting two grooves in the guide bushing and it will be noted that the top of this member is cup shaped. This gathers the superfluous lubricant which runs back into the crankcase through the two grooves in the bushing. This repair will appeal to the average motorist as the bushing is easier to cut than the tappet which is hardened and will require drawing of the temper and rehardening.

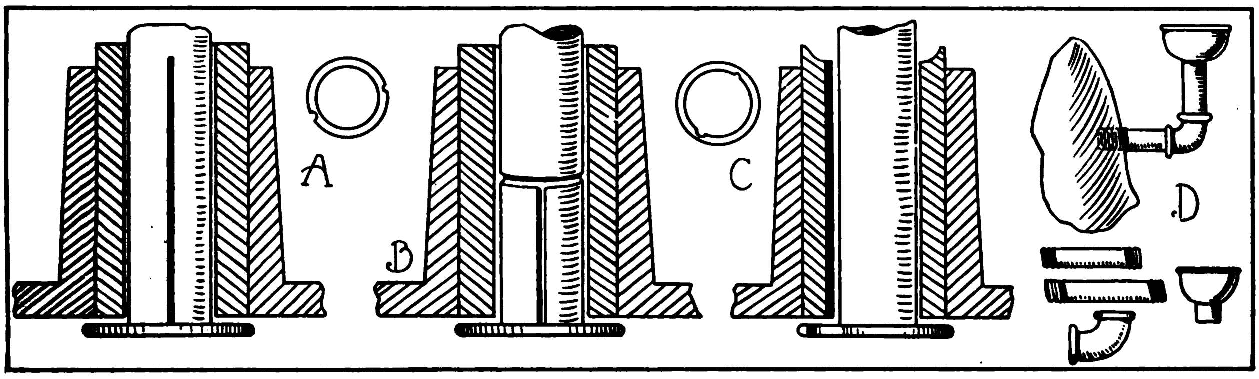


Fig. 2—Remedying Leaky Valve Tappets: A, Cutting Grooves in Tappet to Allow Oil to Return to Crankcase; B, Circumferential Recess and Grooves; C, Cupping Valve Guide Bushing and Grooving Sides; D, Home Made Breather Adaptable Where Vertical Member Cannot Be Fitted.

ANTI-FREEZING SOLUTION HINTS.

With the approach of spring the cooling system of the motor car should be given consideration. Those who have employed an anti-freezing solution of sufficient strength to take care of low temperatures will discover that the motors on mild days show signs of heating, especially if operated with a retarded spark or allowed to run idle.

This does not indicate that the cooling system is at fault. It must be remembered that denatured alcohol boils at a temperature of about 172 degrees Fahrenheit and that even when blended with water, will heat more easily than the latter alone. Many motorists are still employing a solution having 25 per cent. alcohol, but this is not necessary as it is to be doubted if the thermometer will register many degrees below the freezing point from now on.

Five per cent. of alcohol and 95 per cent. water will not freeze with temperatures higher than 25 degrees above zero Fahrenheit, and a solution of this strength will not unduly overheat the motor even when the thermometer registers well above the freezing point. If the car be exposed to the cold it is well to employ a solution of the above strength until well into April, as the nights may still be cold.

Those who have made it a practise to cover part of the radiator should remove the covering on mild days or dispense with it entirely. The fan belt should be replaced to prevent the water in the cooling system from becoming overheated. If the old anti-freezing solution has been maintained at its full strength water should be added until the hydrometer shows but five per cent. alcohol. If the solution is dirty, it is an excellent plan to throw it away and use new. The radiator should be thoroughly cleansed before using the new mixture. This may be accomplished by making a saturated solution of sal soda or common washing soda, afterwards flushing out the cooler with clean water. The motor should be run during the operation to allow the fluid to circulate freely, and the water should be changed several times.

A TIRE CHAIN HINT.

In the spring of the year when the frost is coming out of the ground one is apt to encounter mudholes, especially in the country. Even with the usual tire chains the motorist is liable to have the rear wheels sink deep in the mire and the car refuse to budge although the wheels spin. The following kink is suggested by an automobilist whose work carries him over the country roads throughout the year: If the wheels spin and become buried in the mud, remove the chains and take one member and wrap it around the tire as you would a blow-out patch. Treat the other wheel in a similar manner, and upon applying power with the low speed gear in mesh, the machine will jump out of the hole. The bunched up chain provides traction not possible with the member fitted in the usual manner.

TIGHTENING HUB CAPS.

Occasionally hub caps are lost through carelessness in replacing these members after lubricant has been applied. While they should be set up snugly, undue force should not be used as the threads of the brass member may become stripped. An excellent plan is to screw the caps up tightly then tap the wrench a light blow with the hammer. Sometimes too much lubricant is utilized and when tightening up the cap the grease gives one the impression the cap is snug. Under these conditions the cap will loosen.

DOUBLE CURING OF TIRES.

"Although the term 'double curing of tires' is mystifying to the average motorist, it is perfectly simple," says L. C. Rockhill of the Goodyear Tire & Rubber Company, Akron, O. "The Goodyear No-rim-cut tire passes through a long process between the time it leaves the factories until ready for shipment. Before it is cured the rubber is soft and plastic. It becomes more so when subjected to the steam heat of the curing process.

"The first step is the tire mold. This is continued just long enough to give the tire its shape and to insure that the layer of fabric and the gum of the carcass have been cemented thoroughly. Then the shoe is taken out of the mold and inspected carefully. This mid-cure examination makes it possible to detect 'duck pinches,' unsuspected accidental folds in the fabric, or any other imperfection that might creep in during this step of the process.

"The surface of the shoe is then roughened and the heavy rubber tread attached. When this is in position an air bag is placed inside the carcass and the tire wrapped firmly in a long strip of damp muslin. Then the air bag is inflated so that the tire, in the final cure, will take exactly the shape it will have when in use. By this method the possibility of unbalanced strains is eliminated."

CARE OF MAGNETO PLUGS.

Owing to the intense spark provided by the magneto the plugs should be removed occasionally and examined for satisfactory results. Unlike the ordinary plug, current for which is furnished by a battery, the magneto plug operates best with a small gap. This should be about .015625 inch, but it may be increased in time by the action of the heat. Sometimes erratic running of the motor at low speeds is due to irregular spark plug gaps. They should be uniform.

HOME MADE WORK BENCH.

Many owners garage their machines upon the premises and the average building is constructed to house one automobile and leave room enough to work around the machine. There is more or less minor work necessary, even if the owner does not attend to his own repairs.

Under these conditions and even where more extensive work is done the garage should include a work bench fitted with a vise. This combination will lighten labors wonderfully as well as facilitate the work. In addition the tools are kept in their proper place, being handy when needed and economy is effected as their cutting edges are not damaged as is very likely to occur when they are laid around promiscuously, one on top of another, in various parts of the garage.

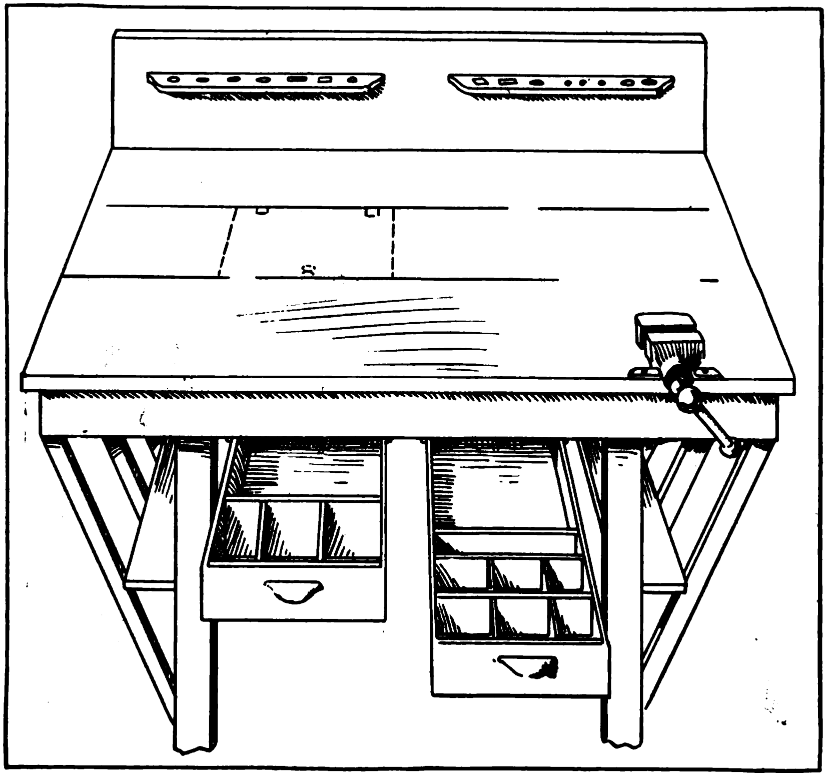


Fig. 3—Plan of Home Made Work Bench Which Provides for Shelves and Drawers, a Valuable Addition to the Equipment of the Private Garage.

A substantial work bench may be constructed at little expense if one can handle a saw, hammer and trysquare, and the design may be elaborate or simple, according to the tastes of the motorist. At Fig. 3 is presented a bench which will answer all requirements. It will be noted that provision is made for drawers and that in addition to the bench proper a lower shelf is included.

The dimensions of the design illustrated provide for a bench five feet in length, two in width and about two feet 10 inches high. The latter dimension may be increased or decreased according to the height of the user. It is not a good plan to build the bench so low that one will have to bend over in working. The height given is about the average.

The lower shelf is approximately three feet long and two wide. The side members are about nine inches wide and two feet long. It will be noted that the bench proper is fitted at the back with a vertical extension and that provision is made for the tools. Two strips are made of wood and these bored to take screw drivers, files, pliers, scrapers, etc. If one wishes to lock up the tools a section of the bench may be cut out and hinges and a lock fitted, the tool racks being attached on the inside, as outlined in the drawing.

The lumber used may be planed or unfinished stock, according to tastes of the owner. The planed material costs slightly more, but presents a neater appearance. The legs of the bench should be constructed of square joists and the bench proper of material at least two inches thick. The latter should be free from knots, and the planks nailed securely to prevent warping. The drawers may be made of whitewood, but they should be sturdy as in time considerable heavy material will be placed in them.

The trays should be divided into several compartments in which the nuts, bolts, cotter pins, etc., should be separated. It is surprising to note the number of motorists and even repairmen, who jumble these parts together and when a nut or bolt is wanted, lose considerable time in searching for the desired article.

In the overhaul work the bench will prove useful for the various small parts may be stored on the lower shelves while the ample size of the bench proper will accommodate the cylinders and other parts removed for cleaning and attention.

A SEARCHLIGHT SUGGESTION.

Searchlights of the dash type are favored by some motorists as these lamps may be adjusted instantly and without the operator leaving the seat. They are at a disadvantage, however, when the use of the storm curtain is desired. Following is a method adopted by an automobilist who drives considerably at night, and who also uses the storm curtain for protection against the wind:

A hole slightly larger than the diameter of the lamp was cut in the celluloid and the edges of the latter bound with leather. The front of the light projected through the opening, which was large enough to allow the lamp to be moved as desired. At the right of this was cut another opening for use during stormy weather.

SLIPPING CAM CAUSED TROUBLE.

Where cams are not integral with the shaft and are driven on and fastened with a pin, it is rare that trouble ever is experienced. An exception, however, was noted in a machine, which came into the garage on three cylinders. The owner was an experienced motorist and confided to the repairman that he had been over the ignition system, valves, tappets, etc., but had given up the problem. The workman after trying the usual methods, began testing the compression with one petcock open at a time.

It was found that one cylinder apparently had two compression strokes in the usual cycle; two turns of the crankshaft. This puzzled the operator for some time, but it finally was noticed accidentally that both the intake and exhaust valves on the cylinder opened at about the same period. The crankcase was removed and it was found that one of the pins holding the cam had sheared and allowed the latter to turn very gradually on its seat. In moving it had abraded the shaft somewhat and finally jammed into an incorrect position, causing the exhaust to open with the intake. The owner complained that there had been a gradual falling off of power and this, no doubt, began when the part became loose and started to shift.

NAPHTHALENE AS A FUEL.

That naphthalene is valuable as a fuel for internal combustion motors has been proved by the experiments of Chardon and Lion, with a 45 horsepower commercial car towing another truck, the total useful load being eight tons. The material was melted during the first 12 minutes run, during which gasoline was employed. The solid ingredient was introduced into the carburetor at a temperature of 176 degrees Fahrenheit, together with air treated by the escaping gases. The latter had no appreciable odor or color when the lubricant was not excessive. About 20 pounds of naphthalene an hour was consumed. It was crystallized in pieces about the size of a chestnut and contained less than .5 per cent. impurities. From observations made in the course of these trials, it appears that the material increases the effect of the lubricants. The cost of running was figured at one-third to two-thirds cent a ton-mile. The Gasmotorenfabrik Deutz uses naphthalene in briquettes. These are placed in a reservoir surrounded by pipes through which flows water heated to a boiling point by the escaping gases. The carburetor is also heated. The engine is started with gasoline and this used until the water boils, which occurs in about half an hour.

A SPARK PLUG HINT.

When new cars are being broken in and tuned up it is customary to use excess oil and sometimes this fouls the plugs and continues to do so until the feed is cut down to normal. In some types of machines the lubricant works up past the piston rings which necessitates frequent cleaning of the ignition points. If the plugs are of the long nosed design, the trouble may be overcome by threading two or three ordinary spark plug washers on each member in place of the standard single device. This brings the electrodes higher up in the cylinder and less oil is deposited.

FITTING FENDER BRACES.

Vibration has a deteriorating effect upon sheet metal if the material be not fastened securely, such as with fenders of the motor car. At Fig. 4 is illustrated a device fitted by a motorist to prevent the fenders from vibrating. It consists of two braces, one on either side, made of .3125-inch round rods. These were made in two pieces and threaded at both ends. A turnbuckle was utilized to connect the sections and for adjustment. One end of the rod was passed through the fender and secured by a locking nut while the other extremity was similarly attached to the radiator.

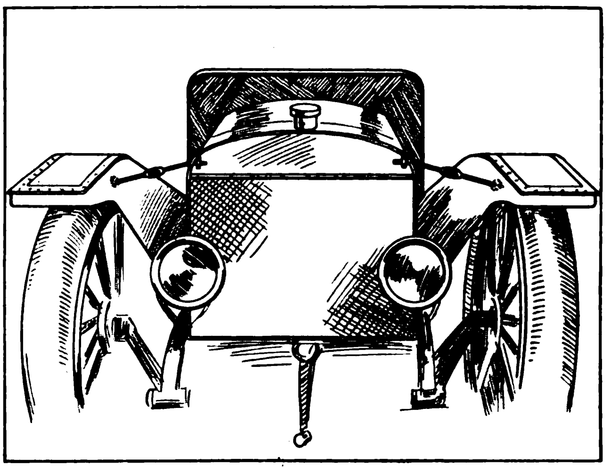


Fig. 4—Easily Constructed and Fitted Device for Bracing and Preventing Fenders from Rattling.

IMPROVING ACETYLENE LAMPS.

Owing to the spaces provided to carry off the heat in gas lamps more or less dust and dirt finds its way into the members and after long service the black paint becomes shiny, especially if it be cleaned frequently with a stiff cloth. This paint is utilized to absorb certain rays of light and may be renewed easily by using a dead black.

THE INDUSTRY AND THE TRADE.

New Electric Car from Chicago---California Tire Concern Completes Factory---Body Maker Increases Capital---Goodyear Company Issues Stock Dividend---Other Interesting Items of News Gathered from All Sections.

The Chicago Electric Car Company has been formed in Chicago, and is stated to have millions behind it. Chicago electrics will be made in a plant which has been secured at 35th and Morgan streets, and the new car is described as being shaft driven, with a wheelbase of 96 inches. Bodies will be of aluminum, and of three, four and five-passenger capacity. A new Westinghouse motor of exceptional lightness and strength will be used. F. J. Newman, formerly with the Woods Motor Vehicle Company, is president of the new concern, A. J. Leopold is secretary, and Albert Meyer treasurer. The engineer will be C. J. Blakeslee, who was with the Woods organization for some time.

The Savage Tire Company, which was organized some little time ago, has about completed its factory buildings in San Diego, Cal., and the machinery has been ordered. Although no definite announcement has been made concerning its plans, it is understood that a punctureless tire will be produced. The personnel of the company is such as to awaken interest in the enterprise. A. W. Savage of the Savage Arms Company is president; J. B. and Claus Spreckles, interested in the sugar industry, are vice president and secretary, respectively, and W. P. Bock is treasurer.

The Racine Manufacturing Company, Racine, Wis., maker of bodies, tops, etc., was recently reorganized and the capital stock increased to $800,000. F. K. Bull was elected president, and will take an active part in the affairs of the company with the assistance of J. W. Gilson, the vice president, who was formerly with the Hartford Rubber Works and later with the Mitchell-Lewis Motor Company. The other officers are: Treasurer, G. W. Jagers; secretary, Harold Smith.

The San Francisco branch of the Studebaker Corporation is to separate shortly into two parts, one handling automobiles alone, and the other the horse vehicles made by the Studebaker concern. Heretofore, both the products have been handled by the one branch, the Studebaker Bros. Company of California, under the management of Chester N. Weaver. He will take charge of the new concern which is to be organized as the Studebaker Corporation of America, for the sale of the Studebaker automobiles in California. The old company will continue to handle the wagon interests and will be placed in charge of L. F. Weaver, manager of the branch in Portland, Ore.

The Detroit Automobile Dealers' Association held its annual election recently, with all the 26 members present. W. F. V. Neumann was elected president, succeeding George Grant. The other officers were elected as follows: Vice president, H. D. Moran; secretary, Joseph Schulte; treasurer, C. C. Starkweather.

Mark Merriman, vice president of the Hayes Wheel Company of Jackson, Mich., has purchased a plant in Albion, Mich., where he will produce wheels and wheel parts, confining himself more particularly to the latter.

The Kelly-Racine Rubber Company, Racine, Wis., has added $150,000 to its capital in order to allow for the expansion which a rapidly increasing business has made necessary. The annual output is given as $1,200,000, which is a good showing, considering that the company has only been in existence two years.

The Goodyear Tire & Rubber Company, Akron, O., is to distribute a stock dividend of 100 per cent. This will be made possible by the increase of the capital stock from $6,000,000 to $15,000,000.

The Day Automobile Company, Detroit, has leased a factory at 25 East Milwaukee avenue. The building is two stories high, and gives the maker of the Day utility car 20,000 square feet of floor space.

Dealers and garage men in Racine, Wis., are planning to organize an association for mutual protection and the advancement of trade. One of the objects will be to eliminate the man who obtains an agency solely for the purpose of getting a car for himself at a low price and interferes with agents who actually try to sell cars. Good roads also will be promoted.

The Warner Instrument Company, Beloit, Wis., maker of Warner Auto-Meters, is to erect an addition to its large plant. The new structure will be of concrete and brick, 100 by 100 feet.

The Scheidel-Thompson Manufacturing Company is to begin operations in the Industrial building, Indianapolis, Ind., about June 1. Sheet metal parts, such as hoods, fenders, tanks, tool boxes, etc., will be made.

Chester S. Ricker, who has been prominent in the trade press, has become mechanical engineer and designer for the Henderson Motor Car Company, Indianapolis, Ind.

A. L. Tisch has succeeded A. A. Franklin as advertising manager of the Haynes Automobile Company, Kokomo, Ind. Mr. Tisch comes from New York, and as he has had actual mechanical experience as well as advertising training, he will be a valuable acquisition for the Haynes forces.

The Sigmund Auto Truck Company has been organized in Milwaukee, Wis., and will make a motor truck. The capital is $50,000, and the firm is composed of N. W. and B. P. Marx, and Jesse L. Stroede.

The Duplex Coil Company has decided to remain in Fond du Lac, Wis., sufficient inducements having been made by local business men to cause it to give up the plan of moving to Bay City, Mich.

The Waukesha Motor Company, Waukesha, Wis., is publishing a new house organ under the editorship of H. L. Horning. It is called Power and Efficiency, and is designed to appeal to manufacturers, sellers and users of motor vehicles.

The Punctureless Tire Company, maker of the Dahl tire filler, has moved to new quarters at 1323 Michigan avenue, Chicago, which affords 25,000 square feet of floor space.

It is rumored that the J. I. Case Threshing Machine Company of Racine, intends to spend $1,000,000 on a new plant which it is constructing near its present works.

The Henry Manufacturing Company, maker of the Blitzen self-starter, has opened a branch in Chicago at 1120 Michigan avenue, which is in charge of Frank S. Murray.

The Cole Automobile Company is the new name of the San Diego, Cal., agent for the Cole, made by the Cole Motor Car Company, Indianapolis, Ind. The concern was formerly known as the Bowler Motor Car Company. It is erecting a new salesroom and service station, and will shortly have a modern establishment in which to care for its rapidly increasing business.

Portland, Ore., dealers have been changing locations recently. The Portland Motor Company has moved to a new home at 23rd and Washington streets; the Becker Automobile Company is now located at 14th and Everett streets; while the United Auto Company is occupying a new salesroom at 16th and Alder streets.

Ralph W. Keeler has been appointed general manager of the Miller Car Company, recently organized. The Miller car will be made in Detroit.

E. E. McCleish has resigned as advertising manager of the Paige-Detroit Motor Car Company, Detroit, in order to accept a similar position with the Airlane Motor Company.

F. G. W. Sudrow has been made sales manager of the Apple Electric Company, Dayton, O. He has been succeeded in the management of the Detroit branch by H. J. Shire.

A. B. Brakman has been placed in charge of the United States Motor Company's interests on the coast, and will have charge of branches in Los Angeles and San Francisco.

A. J. Rogers, who has been connected with the sales department of the Remy Electric Company, Anderson, Ind., has been appointed manager of the Remy magneto branch and service station in San Francisco.

The Warren Motor Car Company, Detroit, has doubled its capital, having added $300,000 to the original stock.

Morgan & Wright, Detroit, a constituent of the United States Tire Company, New York City, has secured the Oldsmobile plant in which the famous curved dash runabouts were made, and will use it as an addition to the already big Morgan & Wright tire factory.

J. A. Boyle has been elected vice president of the Briscoe Manufacturing Company, Detroit. He will still retain the office and duties of general manager. J. A. Holihan has been promoted to become assistant general manager.

The Briggs Manufacturing Company, Detroit, maker of the Detroiter car, has started the construction of a new factory at Denton avenue and the Grand Trunk Railroad.

Charles W. Garratt has become secretary and treasurer of the Federal Motor Truck Company, Detroit, maker of Federal commercial vehicles. He was previously connected with a steam radiator and heating concern.

The Diamond Rubber Company, Akron, O., is erecting a new building which when finished will be one of the company's largest factories. It will be six stories high, and 275 feet long, and it will be used for the manufacture of tires.

The Willard Storage Battery Company, Cleveland, O., has moved its offices to 5716 Euclid avenue, and has started work on an addition to the factory which will afford 25,000 square feet of much needed space.

The Lauth-Juergens Motor Car Company, Fremont, O., is erecting an addition to its factory, which when completed will enable it to double the output of Lauth-Juergen trucks.

The Saxon Manufacturing Company, which was organized in Toledo, O., some months ago, following the failure of the Saxon Lamp Company, has leased a five-story factory in Toledo, and will take possession early in the summer.

Hartford, Conn., motorists will have to pay higher garage storage rates, six of the principal garages having agreed to raise their rates. The new figures run from $15 a month for open cars of 112-inch wheelbase to $25 a month for limousines. This includes washing and polishing service.

The Portland, Me., dealers have organized the Portland Automobile Dealers' Association, and intend to conduct a reliability run. A show is also planned and the association is considering the erecting of a building for the purpose, if no suitable structure can be obtained.

The chauffeurs employed by the city of Boston are to take a course on gasoline motors at the Franklin Union for eight weeks. Three lectures a week will be given, and those who show special aptitude for the work and obtain a certificate from the Union, will receive an increase in salary from the city.

The Pittsfield Spark Coil Company, Dalton, Mass., has been reorganized, the capital being increased from $100,000 to $250,000. L. B. Hopkins, formerly with the General Electric Company, has become treasurer, and H. Allen, formerly with the Simms Magneto Company, is the new manufacturing superintendent.

Woodworth treads are to invade Europe, A. Hedinger, formerly Boston manager of the Leather Tire Goods Company, Niagara Falls, N. Y., having sailed for the other side, where he will have the Continent as his territory in appointing agents.

Leslie R. Pratt has leased the factory at 1717 Eighth avenue, Brooklyn, N. Y., from the Cooper Diamond Company, and will use it for the manufacture of rubber tires.

The Kline Motor Car Company, Pittsburg, Penn., is to erect a building at a cost of $30,000, to contain salesrooms, garage and repair shop, as well as a touring information bureau.

Cram & Sovereign, Geneva, N. Y., reports that it has a 1500-pound motor truck almost ready for the market. It will embody a number of desirable features.

New Orleans, La., is to use automobiles in collecting the mails. The postoffice department has authorized the use of motor trucks in handling mail to and from the stations and docks.

The Dyneto Electric Company has outgrown its factory in Elbridge, N. Y., and is to move to a larger plant in Syracuse.

The Empire Automobile Company, now operating a factory in Greenville, Penn., is to have three factories in as many cities, according to the plan announced recently. A second factory will be built in Indiana, in either Knightstown or Indianapolis, and Missouri will get the third factory, in either Kansas City or St. Joseph.

The St. Paul Rim & Axle Company, which is capitalized for $100,000, is reported as looking for a factory site in St. Paul, Minn., in the Midway district. The manufacture of a new arrangement by means of which tires may be demounted with the present rims is contemplated, and drop forging will also be undertaken.

The Council Bluffs Auto Starter Company has been organized in Council Bluffs, and will manufacture a starter invented by H. L. Meeder.

P. E. Zimmerman has been appointed general manager of the Hagstrom Bros. Manufacturing Company, Lindsborg, Kan., after having been in charge of the advertising end of the business for some time.

The Motor Specialties Company, Waltham, Mass., is shortly to move into a larger factory, having secured building No. 1 of the Waltham Gas Company's plant. The concern makes a variety of accessories, including spark plugs, timers, distributors, gas lighters and jacks, and the business in these has increased so as to make larger quarters necessary.

The Wenonah Motor Truck Company, Bay City, Mich., is to be incorporated to manufacture motor trucks of 1000 to 1500 pounds capacity. A. B. Perkins is president of the new company, which will consist of himself, his three sons, and G. E. Porter.

Harry H. Elmer, formerly with the Haynes Automobile Company, has joined the Grant-Lees Machine Company, Cleveland, O., as vice president, general manager and director. He will take charge of the designing and building of a new six-cylinder car, the Grant-Six, which is to appear shortly. A modern plant is now under the course of construction in which the new car will be built.

R. S. Bryant has been appointed consulting engineer of the Standard Welding Company, Cleveland, O., and will keep an eye on the production of the company's automobile rims and other parts. He was previously connected with the Bryant Rim Company in Columbus, O.

Charles Y. Knight, the inventor of the well known sliding sleeve engine which bears his name, is planning to issue a monthly magazine devoted to his invention. It will be published at Coventry, England, where Mr. Knight now resides, and where the Daimler works are located.

The United States Tire Company, New York City, has issued an interesting little booklet entitled "How I Became 'Tire-ly Satisfied," covering the conversion of a motorist to the United States brand of tires.

W. E. Flanders is said to be interested in a new six-cylinder car for which W. H. Cameron, formerly designer and engineer for the Overland Motor Car Company, now the Willys-Overland Company, is responsible. It is understood that the new car will be placed on the market in the near future from the plant of the Universal Motor Truck Company, Detroit.

C. F. Splitdorf, New York City, is numbered among the accessory makers who have established service stations for the convenience of their patrons. Splitdorf service stations are now located in New York, Boston, Detroit, Chicago, Kansas City, San Francisco and Los Angeles. Others are to be opened in the near future.

The Lynn Automobile Dealers' Association, Lynn, Mass., has decided that second hand cars will no longer be accepted as part payment on new machines. Cut rates on accessories are under advisement, and the association hopes to do away with these as well.

The K-W Ignition Company, Cleveland, O., is distributing what is probably one of the most complete catalogues of electrical automobile apparatus that has appeared. The book has 64 pages, and five of them are devoted to instructions for fitting the K-W lighting magneto to cars not already equipped with magnetos.

A. E. Beharrell is now associated with the Velie Boston branch, having left the Velie agency in Lowell, Mass.

At a recent meeting of the board of directors of the United States Motor Company, New York City, L. E. Latta, who has been with the company since its organization, was elected secretary. He was formerly secretary of the Maxwell-Briscoe Motor Company. F. D. Dorman has resigned from the United States Motor Company to become president of the Steinbock Engineering Company, which was recently organized to make moderate priced cars.

Herbert Lytle, the veteran race driver, is now manager of the Indianapolis branch of the Apperson Bros. Automobile Company, Kokomo, Ind.

E. B. Cartwright, Haverhill, Mass., recently drove his car equipped with Ajax tires over a total distance of 7000 miles without a puncture or blow-out.

A new electric model is being produced by the Flanders Manufacturing Company, Detroit. It has a battery of 30 cells, distributed 20 in front and 10 in the rear and larger motor and a better controller mounted on top of the steering column. The body design is colonial, on the style of a previous model. The wheelbase has been lengthened three inches.

MISSOURI'S CENSUS FIGURES.

While Missouri may not be classed as one of the most important automobile producing centres of the country, the report of the census bureau with reference to its findings during the 13th census shows that the number of factories in the state producing automobiles, bodies and parts, increased from three in 1904 to 17 in 1909. The total value of products increased from $63,000 to $1,677,000 during the same period. The statistics for the state and the city of St. Louis follow:

State of Missouri.

	1904	1909
Number of establishments	3	17
Persons engaged	37	449
Proprietors	3	6
Salaried employees	13	75
Wage earners	21	368
Primary horsepower	20	184
Capital involved	$24,000	$800,000
Salaries paid	5,000	85,000
Wages paid	16,000	252,000
Cost of materials	31,000	1,025,000
Value of products	63,000	1,677,000
Value added by manufacture	32,000	652,000

City of St. Louis.

	1904	1909
Number of establishments	3	11
Persons engaged	37	340
Proprietors	3	2
Salaried employees	13	56
Wage earners	21	282
Primary horsepower	..	139
Capital involved	$24,000	$620,000
Salaries paid	5,000	62,000
Wages paid	16,000	197,000
Cost of materials	31,000	727,000
Value of products	63,000	1,302,000
Value added by manufacture	32,000	575,000

FIRE EXTINGUISHER.

An excellent fire extinguisher for the garage is said to be an ordinary syphon of soda, as it is claimed that the fluid is very effective in quenching burning gasoline, the carbonic acid gas being non-combustible.

Patching Blow Out Holes—When a hole in a shoe is to be patched, particularly one made by a blow out, the rubber is first hung over a block form, and the material cut clear through to the fabric. This is done all around the shoe, including the bead if a thorough repair is to be made. The surface should then be buffed, ground or sand papered down to an even and regular smoothness, after which the building up or stepping process may proceed.

INDUSTRY APPROVES TRADE FACT EXCHANGE.

Unqualified Indorsement of Service That Means General Promotion of the Interests of All Concerns Constituting the Market of the Nation.

The Trade Information Exchange established in connection with the publication of the Accessory and Garage Journal has been approved by the industry and the trade unqualifiedly. The Exchange places at the disposal of any individual or firm the information in its files and library and it will supply any fact that may be desired and is procurable. There is no limitation to the number of inquiries that may be made. The larger the demands made upon it the better will it serve its subscribers, and as the service continues it will no doubt be improved, because the facts available will be augmented and arranged to minimize time and correspondence.

The Exchange is free to all concerns listed in the Buyers' Guide published in The Automobile Journal, the Motor Truck and the Accessory and Garage Journal, and to all automobile dealers, accessory and supply dealers, garage and public service station owners and managers, and repairers, who are regular subscribers to the Accessory and Garage Journal. The Exchange is not free to manufacturers and selling agents for manufacturers not listed in the Buyers' Guide of the three publications named.

The relations of the Exchange are confidential. Through it the man who desires any information may obtain it without loss of time, with a minimum of correspondence and from every trade interest from whom he seeks facts that will be promotive of his own business and stimulative of the entire market. It conveniences the trade because it affords to the inquirer all the detail that relates to the products of the industry he desires information of. It places the manufacturer and the selling agent at parity so far as establishing relations is concerned, and it opens to all alike associations that could not be created save through personal solicitation and material expense.

There is no advantage for the one as compared with the other negotiations through the Exchange. All receive the same degree of attention and merit of production is the one element that should influence all whatever transactions are consummated. The business man who has need of any fact can obtain it at no other trouble than writing an inquiry and mailing his letter. He then has all the resources of the Exchange and he can obtain from a single query not only the detail of any given production, but he can ascertain the selling propositions of all those who manufacture this line.

There is no restriction as to the section of the market under consideration. The service applies equally well to any town, city, state or part of the country. It permits the trade a selection of any article from the whole of the industries and there is no influence other than actual merit entering into the transactions that may be considered or determined. There is no possibility of misunderstanding or embarrassment of any interest. The confidential nature of the Exchange is such that there can be no advantage in matter of distance because the inquirer, having a choice, will not close a contract or connection until he has received the replies from those of whom information was sought.

It is obvious that promptness by the Exchange and by those entering into negotiation is absolutely essential for the realization of the fullest benefits. It is not practical nor reasonable to believe that delays can be tolerated, but it is always possible in the event of inability to make reply to an inquiry to send a letter of advice stating the fact and when a complete statement can be made. This is not stated as a mere courtesy, but as a condition that should be carefully observed by those who are at any time in communication. There can be no responsibility assumed by the Exchange for failure to act promptly, and that there may be no uncertainty an accurate record is kept of the time of receipt of all mail, as well as the time of the dispatch of all sent out.

It may be understood because of the volume of business conducted by the Exchange that it is necessary to have the records as simple as is possible and maintain the completeness essential. The use of forms is imperative and it is not possible to afford the character of service desired unless those who shall benefit through it co-operate, if manufacturers and selling agents, in supplying the latest file of printed or other information, and supplementing this from time to time as amended, revised or added to. In fact not a little depends upon the quality of the matter filed.

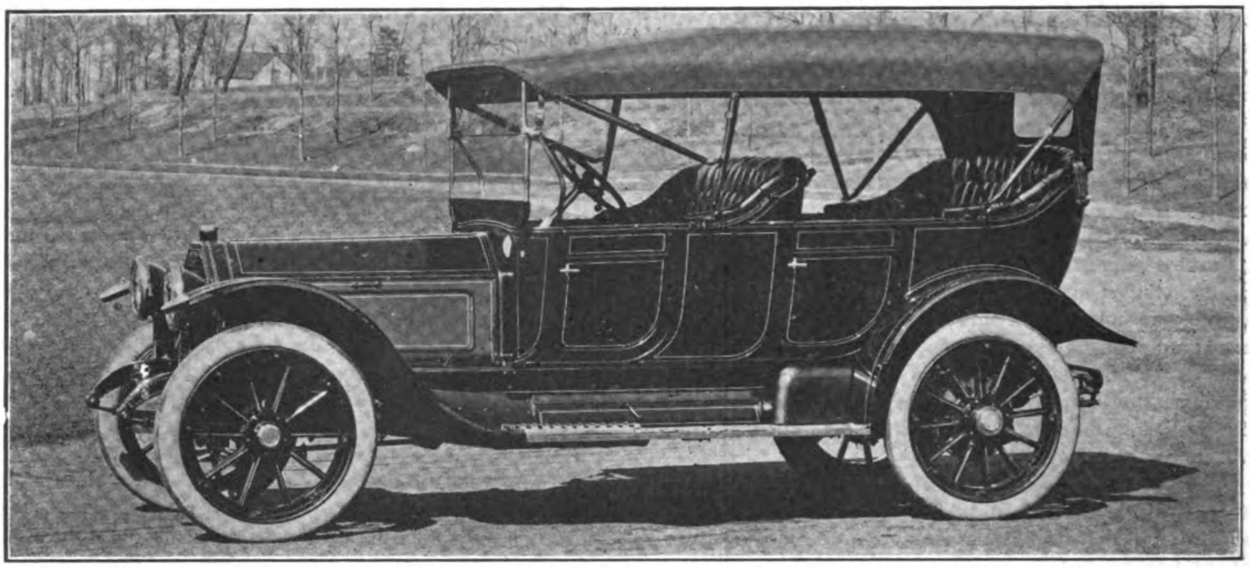
When the Exchange has received, transmitted and exchanged all facts and correspondence with any given inquiry its responsibility as an intermediary ceases. It cannot guarantee that there will be a positive result in negotiations but it will have afforded to all concerned its entire facilities for promotion and for general business advancement.

REMOVING STUBBORN NUT.

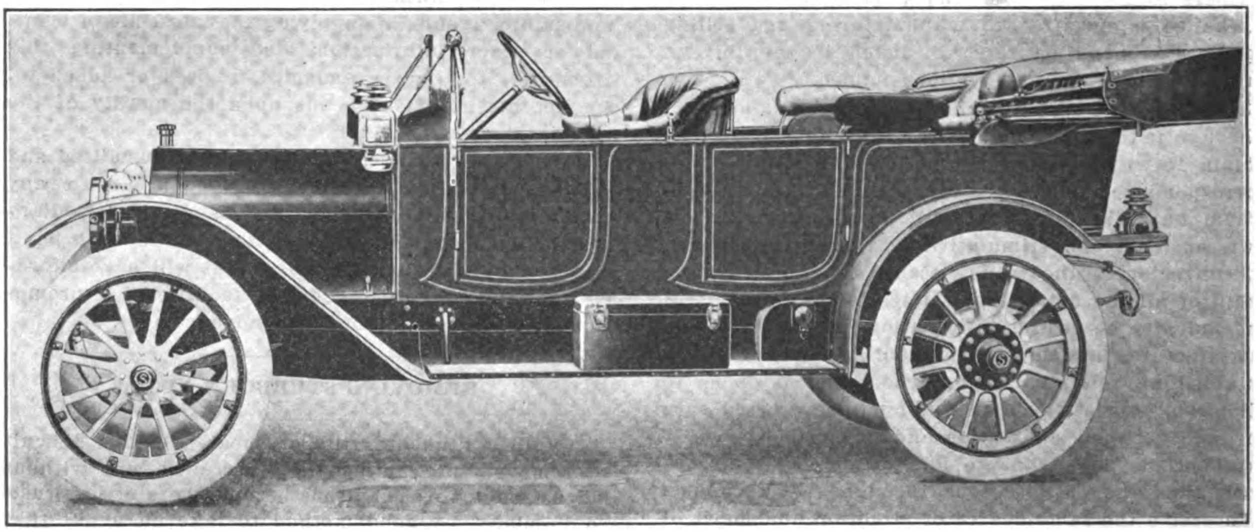
While a stubborn stud or sheared bolt is difficult to remove, one can usually unscrew a nut without much trouble, even if it has become more or less rusted in place. A good method to take off a nut that seems to resist being parted from its stud or bolt more than usual is to heat an open spanner that fits the nut and let it rest against the nut for a few minutes. The heat will expand the nut without producing corresponding expansion of the bolt and it may be unscrewed easily. The spanner or end wrench may be heated in a blow lamp flame, and while this kink is very old it is not generally known. One should not heat a hardened wrench or an adjustable member as it may be rendered unfit for use. The blow lamp flame should not be applied to the nut direct because the bolt will be heated and will expand as well as the nut. Kerosene may be poured around the threads with good results, especially if the nut has rusted in place. Several alternate heatings and applications of oil may be needed before the nut is loosened, and if it still resists, a light tapping with a hammer on all the facets while it is hot may assist in having it become looser on the threads.

To whiten a surface for laying out work, mix whiting with gasoline to the consistency of paint, and cover the surface to be marked. The gasoline will soon evaporate, leaving a white surface on which lines can be easily scribed.

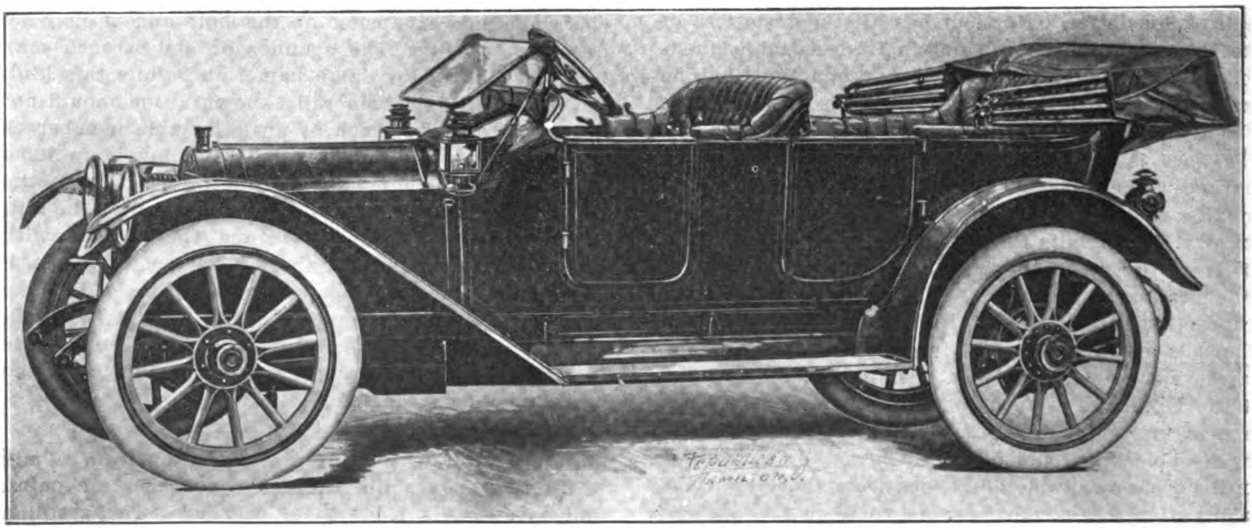
ATTRACTIVE LINES FOR LIVE AGENTS.



The Peerless "38-Six" Touring Car, 1913 Model, Made by the Peerless Motor Car Company, Cleveland, O.—Price $4200.



Selden 1912 Model 47 S, Seven-Passenger Touring Car, Made by the Selden Motor Vehicle Company, Rochester, N. Y. —Price $2600.



The Standard Republic Five-Passenger Touring Car, Manufactured by the Republic Motor Car Company, Hamilton, O. —Price $2250.

VALUE OF BUYERS' GUIDE TO THE TRADE.

A Record of Known and Reliable Business Houses, Revised 48 Times the Year Contrasted with the Indiscriminate Listings of General Directories.

A trade directory is distinctly a reference. Its value to the buyer is in the accuracy of its information. Its worth to the concern listed is gauged by the care in compilation and the frequency of revision. Commercial data as ordinarily compiled is with each enterprise of record grouped under its appropriate classification. These lists are published four times a year at the most and are circulated to those who are sufficiently interested to purchase them. Naturally the distribution is limited and the expense is considerable. Aside from active manufacturing interests few are purchased. These directories are general and are not as a rule devoted to any particular industry. Neither are they confined to any special group of industries. They are not public conveniences and are serviceable only to the subscriber.

In these lists all trade interests are given like prominence. The firms that have the highest business reputation and standing are rated at parity with others that may be little known and of doubtful repute. The buyer may be brought into relations with the unreliable concern solely through the fact that he assumed reliability through its apparent equal rating with others in the industry. In this respect the trade directory is a vehicle for those who are unscrupulous to pirate upon the businesses that have been long established and are deserving of confidence and patronage.

The guide for the buyer must be dependable, first of all. It must be accurate and it must be composed of firms of unquestioned reputation. It ought to specify so far as possible to differing products of each concern. Buying at long range is becoming the more and more necessary and time is a potent factor.

The Buyers' Guide published in The Automobile Journal, the Motor Truck and the Accessory and Garage Journal specifies the firms that are actual and legitimate business competitors. The classification is select from the viewpoint of the buyer and the seller. The list is complete in every sense. It directs attention to reliable business houses and inspires confidence in them because they are well and favorably known. Both the buying and the selling interests are benefited.

The Buyers' Guide appears in each issue of these three magazines. It is revised for each edition, and there are 48 distinct publications annually, which insures to those making use of it that it is correct to the day of publication. The compilation is first brought directly to the attention of the subscribers. The magazines are then preserved for reference. The trade directory may have a circulation of 5000 each edition, and four editions annually at the most. The average business guide goes to practically the same persons each issue. The Buyers' Guide is published in The Automobile Journal and reaches its 13,000 subscribers 24 issues the year, and once each month it is received by the 9000 readers of the Motor Truck, and by the nearly 12,000 who subscribe to the Accessory and Garage Journal. This totals approximately 34,000 different interests who receive the Buyers' Guide in the magazines either 12 or 24 times a year. This is from three to six times the number of editions of the best and most progressive general directory and the distribution is about 580 per cent. more.

The value of the Buyers' Guide is alike to all who receive it. The Automobile Journal is published for the benefit of the owners of automobile vehicles. More than 90 per cent. of its circulation is to this class of readers. The Motor Truck is devoted to the promotion of the mechanical wagon for highway transportation and it is read by those who are using such service or are studying haulage subjects with a view to utilization of power conveyances. The Accessory and Garage Journal is given over to the industry producing the pleasure car and the commercial transport, to those distributing them, to those selling them, to those manufacturing equipment, accessories and supplies, to the garage and public service station owners and managers, and the repairers and those who specialize maintenance work.

The Buyers' Guide is a systematically arranged classification of select firms. It is a list of reliable and dependable concerns, known through merit of production and worthy of confidence because of established reputation. It is composed of enterprises producing practically everything that may be desired in connection with the use of the automobile. The Buyers' Guide is revised for each edition and it is more complete than any other in this respect. No less than 48 revisions each year insures the most authentic information.

The Buyers' Guide is a reference instantly at the command of those desiring its facts and specific detail. It contains the precise knowledge wanted and everything not essential is eliminated. It is complete and thorough in all requirements.

Besides the qualities emphasized the Buyers' Guide is published in the editions of Standard Automobile Mechanical Handbooks. The works are the most comprehensive of their kind and are recognized authorities. They are adopted as text books in many of the largest and best known technical and mechanical schools. They go into the hands of those who use them constantly as references. As a complete library of practical worth they are preserved and the lists are always available. The distribution of these volumes will aggregate approximately a half million the present year. This places in the hands of the purchasers of these works the latest and most desirable buying information.

The combined circulation of the Buyers' Guide in the magazines, based on the distribution of April 1, is 564,000 annually, and in the handbooks the most conservative estimate of sales is a half million the present year, so that there will be approximately a million copies distributed during 1912. There is no question as to the figures stated. There is the natural increase that is not considered in the statement made.

The service of the Buyers' Guide is free to all advertisers who have yearly contract with any one of the magazines. Each firm is listed under one or more appropriate classifications. Any new production may be designated, a condition that is especially desirable with any established firm.

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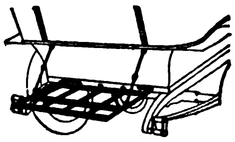

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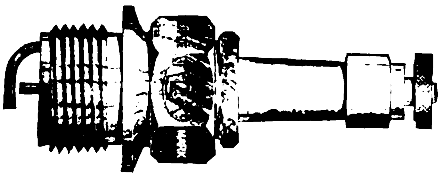

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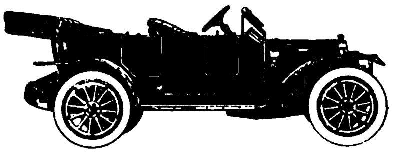

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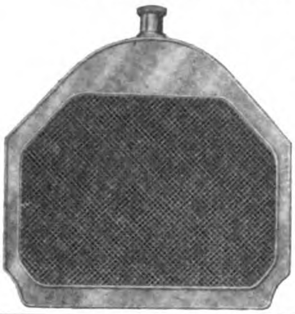

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Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., MAY, 1912. NO.

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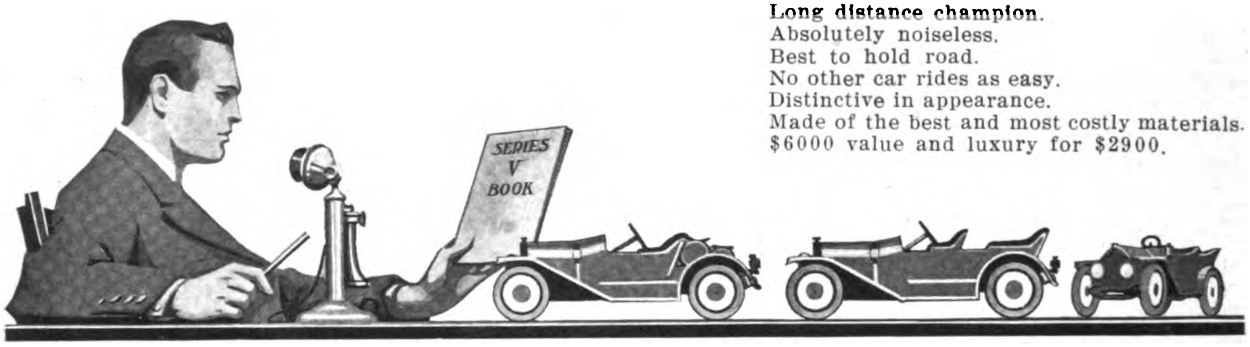

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Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, **Mass.** **Branch:** 113 Massachusetts Ave., Boston, Mass.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass. **Branch: 1974 Broadway at 67th St., New York City.**

Miller, Chas. E., 97-103 Reade St., New York City. **Branches:** 202-204 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York City; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia, Penn.; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence, R. I.

ACETYLENE TANKS.

Prest-O-Lite Company, 271 East South St., Indianapolis, Ind. (Prest-O-Lite.)

Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

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BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York City (F & S.)

New Departure Mfg. Co., Bristol, Conn.

BATTERIES — ELECTRIC STORAGE.

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland, O. (L B A.)

BATTERIES— VEHICLE AND IGNITION.

Geiszler Bros. Storage Battery Co., 514 W. 57th St., New York City.

Waite Auto Supply Co., 81 Exchange place, Providence, R. I. (Success.)

BLOWOUT PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 480 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.) **Branches:** 903 Boylston St., Boston, Mass.; 237 Lafayette St., New York, N. Y.

BRAKES FOR PLEASURE AND COMMERCIAL CARS.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARBURETORS.

Sumner, George, Inc., 1841 Broadway, New York City. (Rayfield.)

CARS—GASOLINE PLEASURE.

Atlas Motor Car Co., 104 Birnie Ave. Springfield, Mass. (Atlas-Knight.) **Branch:** N. E. corner Broadway and 64th St., New York City

Berkshire Motors Co., Cambridge, Mass. (Berkshire.)

Brush Runabout Co., 3 West 61st street, New York City. (Brush runabout, Liberty-Brush.)

Buckeye Mfg. Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)

Cole Motor Car Co. See Henderson Motor Sales Co.

Columbia Motor Car Co., 3 West 61st street, New York City. (Columbia.)

Dayton Motor Car Co., 3 West 61st street, New York City. (Stoddard-Dayton.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Sales Co., Indianapolis, Ind. (Cole.) **Eastern Distributors:** Colt-Stratton Co., Broadway at 68th St., New York City.

Herreshoff Motor Co., 620 Harper Ave., Detroit, Mich. (Herreshoff.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit, Mich. (Hupmobile.) **Branches:** Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis, Ind. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Inter-State Automobile Co., Dept. N. Muncie, Ind. (Inter-State.) **Branch:** 153 Massachusetts Ave., Boston, Mass.

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.) **Branches:** New York City, Chicago, Boston.

Maxwell-Briscoe Motor Co., 3 West 61st street, New York City. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead road, Trenton, N. J. (Mercer.)

Michigan Buggy Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis, Ind. (National.)

Nordyke & Marmon Co., Indianapolis, Ind. (Marmon.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.) **Branches:** 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

R-C-H Corporation, 107 Lycaste St., Detroit, Mich. (R-C-H.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York (Sampson.)

BUYERS' GUIDE---Continued

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit, Mich. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st street, New York City. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)

Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 840 E. 79th St., Cleveland, O. (White.)

Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)

Branch: See Cars—Gasoline Pleasure.

Available Truck Co., 2334 Hamilton Ct., Chicago, Ill. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st street, New York City. (Brush.)

Cartercar Co., Pontiac, Mich. Cartercar.)

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit, Mich. (G. M. C.)

Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit, Mich. (Hupmobile.)

Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)

Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st street, New York (Sampson.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st street, New York City. (Sampson, Brush, Stoddard.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., Detroit, Mich. (Anderson.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit, Mich. (G. M. C.)

Branches: See Cars, Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)

Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York (Sampson.)

United States Motor Co., 3 West 61st street, New York City. (Sampson.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo, N. Y. (Victor.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)

Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CHAINS, TIRE AND ANTI-SKIDDING DEVICES.

Leather Tire Goods Co., Suspension Bridge Sta., Niagara Falls, N. Y. (Woodworth Treads, Kant-Skids.)

Weed Chain Tire Grip Co., 28 Moore St., New York City. (Weed.)

CHAINS — TRANSMISSION OR DRIVING.

Miller, Chas. E., 97-103 Reade St., New York City (Brampton.)

Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES — AUTOMOBILE FRICTION.

Brets Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CRANES.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tanks for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 480 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

GAUGES, ETC.

Goodnow Mfg. Co., 754 Old South Bldg., Boston, Mass. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Tire Pressure and Gasoline Tank Gauges.)

Branches: In all principal cities.

HOISTS.

Canton Foundry & Machine. Co., Canton, O. (Portable Floor.)

HORNS—BULB, ELECTRIC, EXHAUST.

Automobile Supply Mfg. Co., 220 Taaffe Place, near DeKalb **Ave.,** Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston, **Mass.** (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.

Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, **Mass.**; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.; 801 Woodward Ave., Detroit, Mich.

LAMP COVERS.

Hopewell Brothers, Newton, **Mass.** (Hopewell.)

Branch: 1974 Broadway, New York.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.

Branches: In all principal cities.

LIGHTING EQUIPMENT — ELECTRIC.

Dean Electric Co., Elyria. O. (Dynalux.)

Esterline Company, The, La Fayette, Ind. (Matchless.)

Branches: Detroit, Mich.; San Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 810½ Chapel St., New Haven, Conn.

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

Remy Electric Co., Anderson, Ind. (Remy.)

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.

Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 257 Van Ness Ave., San Francisco, Cal.

BUYERS' GUIDE---Continued

Bretz Co., J. S., 250 W. 54th St., New York City (U. & H.)

Kimball Mfg. Co., The, Motor Mart, Boston, Mass. (Mea.)

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

Marburg Bros., 1777 Broadway, New York City (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf, C. F., Walton Ave. and 138th St., New York City.
Branches: 1679 Broadway, New York City; 1110 South Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-436 Van Ness Ave., San Francisco, Cal.; 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MATS, ETC.

Sidwell Pedal Mat Co., 245 Columbus Ave., Boston. Mass. (Pedal.)

MEASURES, ETC.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MOTORCYCLES AND MOTORCYCLE SUPPLIES.

American F. N. Co., Boston (F. N.)
Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Liberty Rubber Co., Orange N. J. (Motorcycle Rubber-Mend.)

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

International Automobile Association, Shelden M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 785 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

OILS, GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)
Branches: Boston, Mass.; Fall River, Mass.; Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)
Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Havoline Oil Co., 17 Battery Place, New York City (Havoline.)
Branches: Pacific Coast — Kohl Bldg, San Francisco, Cal: Western—People's Gas Bldg., Chicago, Ill.: Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Haws, Geo. A., 77 Pine St., New York City. (Panhard.)
Branch: 899 Boylston **St., Boston.**

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)
Branch: 284 Columbus Ave., Boston, Mass.

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston, Mass.; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York City.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston, Mass.; 606 Brown Bros. Bldg., Philadelphia, Penn.; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., 80 Broad St., New York City (Wolverine.)
Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.: 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE PUMPS, ETC.

Randall-Faichney Co., Boston, Mass. (B-Line.)

PATCHES.

Liberty Rubber Co., Orange N. J. (Cementless.)

PUMPS, TIRE.

Brown Co., The, Syracuse, N. Y. (Brown Impulse.)

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

RADIATORS.

Eureka Auto Parts Mfg. Co., 3100 Olive St., St. Louis, Mo. (Eureka.)

RIMS — REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

RUBBER CEMENT.

Liberty Rubber Co., Orange, N. J. (Liberty Patching.)

SELF-STARTERS.

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland, O. (L B A.)
Branches: 136 West 52nd St., New York City; 1191 Woodward Ave., Detroit, Mich.; 436 South Dearborn St., Chicago, Ill.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York City; 222 Eliot St., Boston, Mass.; Teck Building, Buffalo, N. Y.; 10 W. Eager St., Baltimore, Md.; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J.

Frontier Specialty Co., 784 Main St., Buffalo, N. Y. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Randall-Faichney Co., Boston, Mass. (Mac-Kae.)

Progressive Mfg. Co., The, Torrington, Conn. (Black Eagle.)

Rex Ignition Manufacturing Co., 1779 Broadway, New York. (Rex.)

Splitdorf Electrical Co., Walton Ave. and 138th St., New York City.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORDING DEVICES.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York City; 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland,

BUYERS' GUIDE---Concluded

Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)
Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.; 1212 South Main St., Los Angeles, Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 870 Woodward Ave., Detroit, Mich.; 330½ North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis, Mo.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Ignition Co., 2829 Chester Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton. Mass. (Hopewell.)
Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1197 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Diamond Rubber Co., Akron, O. (Diamond.)

Empire Tire Co., Trenton, N. J.
Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston, Mass.; 17½ Dorrance St., Providence, R. I.

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In principal cities.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRE INFLATING TANKS.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

Leather Tire Goods Co., Suspension Bridge Station, Niagara Falls, N. Y. (Woodworth treads, repair boots and emergency stops.)

Liberty Rubber Co., Orange, N. J. (Treadmend and Everstick.)

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRE REPAIR OUTFITS.

Liberty Rubber Co., Orange, N. J. (Mend-Do and Rubber-Mend.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special. Motz Cushion.)
Branches: New York, Chicago, Detroit, Kansas City, Cleveland.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tire Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass.
Branches: See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York City.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS FOR AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York City.

TRUCK BODIES.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind.; South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit, Mich.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

TURNTABLES FOR PUBLIC AND PRIVATE GARAGES.

Canton Foundry & Machine Co., Canton. O. (Universal.)

Lansing Co., formerly Lansing Wheelbarrow Co., Lansing, Mich.
Branches: Factory, Parkin, Ark., 78 Cambridge St., Boston, Mass.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VALVE DRESSERS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y.

VULCANIZERS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Garage and Individual.)
Branches: In all principal cities.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, **Mass.**
Cutter, Geo. A., Taunton, **Mass.**
Walworth Mfg. Co., Boston, **Mass.** (Stillson.)

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CHANGES INDICATE INDUSTRY'S GROWTH.

Goodrich-Diamond Merger, Splitdorf Company's Reorganization, United States Rubber Plans and Other Announcements for the Month Denote Increased Prosperity---Several Important Transactions of Unusual Interest.

THE past month brought forth several important changes in the automobile and kindred fields, one of which, the merger of the Goodrich and Diamond Tire companies, may be considered one of the largest transactions in the history of the industry. In this, the B. F. Goodrich Company bought out the Diamond Rubber Company, and it is expected that the merging of the capital and interests of the two will result in superior efficiency and economy. Another and almost equally important deal was that by which C. F. Splitdorf, Inc., was reorganized with the introduction of some of the J. F. Alvord capital.

In these important changes is to be seen an indication of how the capitalists regard the automobile field at present. Expansion is the desire of the big firms, who realize that the future before the industry is a large one, and that large facilities must be available to provide for its possibilities. The past year has been full of such consolidations and strengthenings of existing organizations, and this is a most flattering indication of a present stability and prosperity of the automobile industry.

GOODRICH-DIAMOND MERGER

Two Large Automobile Tire Concerns Amalgamate with Capital of $90,000,000.

One of the largest transactions in the history of the automobile industry is noted in the purchase of the Diamond Rubber Company of Akron, O., by the B. F. Goodrich Company of that city, involving, according to the official statement of the interested parties, the sum of $45,000,000. It would appear that the Goodrich concern is to be reorganized in a measure, the following officers and directors being proposed: Chairman of the board, F. A. Hardy, Chicago; vice chairman, F. A. Mason, Akron; president, B. G. Work; vice president and general manager, A. H. Marks; vice president and works manager, E. C. Shaw; vice president and sales manager, H. E. Raymond; vice president and assistant sales manager, W. B. Miller; secretary, C. B. Raymond; treasurer, W. A. Means; additional members of the board, O. C. Barber and C. C. Goodrich. The official statement follows:

"Goldman, Sachs & Co., announces for itself and Lehman Bros., New York City, and Kleinwort Sons & Co., London, that arrangements have been completed for the purchase by the B. F. Goodrich Company (New York) and the transfer to it of the property and business of the Diamond Rubber Company. The companies, as is well known, occupy premises in the city of Akron, O., and are two of the half-dozen largest and most successful concerns of the kind in the United States, each manufacturing a great variety of rubber goods, including automobile tires.

"The consideration to be paid by the Goodrich company is to consist of $15,000,000 of the seven per cent. cumulative preferred stock and $30,000,000 of the common stock of the B. F. Goodrich Company. For the purpose of enabling it to carry out the transaction the B. F. Goodrich Company will immediately call a meeting of its stockholders for the purpose of authorizing an increase of its capital stock by the issuance of an additional $15,000,000 of the preferred stock and an additional $30,000,000 of common stock.

"When this increase of stock shall be effected, the capital of the B. F. Goodrich Company will consist of $30,000,000 of seven per cent. cumulative preferred stock and $60,000,000 of common stock. Goldman, Sachs & Co., and Lehman Bros., of New York City, and Kleinwort Sons & Co., of London, have agreed to purchase from the Diamond Rubber Company a large block of the stock of the B. F. Goodrich Company, which, together with the previous purchase of stock made at the time of the organization of the present B. F. Goodrich Company, will comprise about one-half of the entire issue of the preferred stock of the latter company and a considerable amount of the common stock as well.

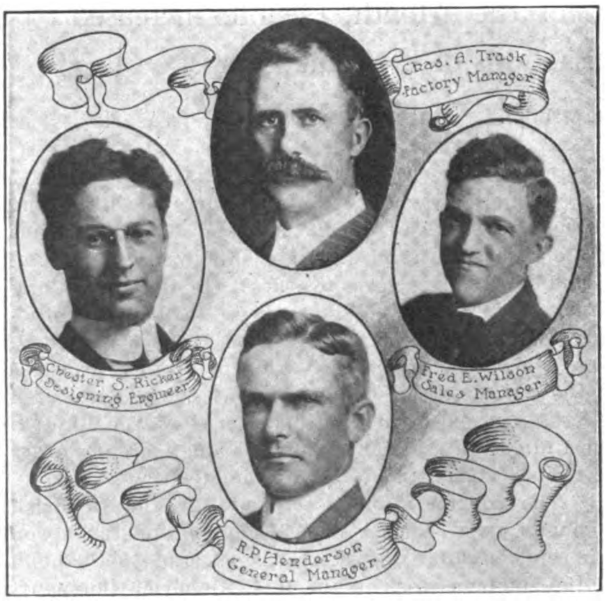
"It is expected that in consequence of the acquisition of this interest by the banking houses named and the distribution of a portion of their stock among their clients a very much broader market for the securities of the B. F. Goodrich Company will exist in the future than has ever existed for the securities of either the old B. F. Goodrich Company or the Diamond Rubber Company. Stockholders of the Diamond Rubber Company upon the distribution of its assets will receive a considerable amount of cash in addition to their several shares in the stock of the B. F. Goodrich Company preferred and common.

"The Goodrich company will retain the executive staff of the Diamond Rubber Company in addition to its present staff, and it is not expected that any radical change in organization or operating conditions will occur."

PRODUCE HENDERSON CAR.

Organization of Company Which Will Manufacture Indianapolis Machine Is Completed.

Much interest attaches to the organization of the Henderson Motor Car Company, Indianapolis, Ind., announcement of which was made recently, largely because of the position held by the Henderson Motor Sales Company, to which the new concern is a logical successor. The personnel of the old distributing agency for Cole cars, made by the Cole Motor Car Company, is represented in the new, with the addition of several names which have been more or less prominently identified with the automobile industry for several years.



Department Managers with the Newly Organized Henderson Motor Car Company.

L. Carter, the president, also is one of the largest stockholders in the Cole Motor Car Company. R. P. Henderson, vice president and general manager, was connected with the Parry Manufacturing Company for a number of years, and has been identified with his brother in the management of the Henderson Motor Sales Company for a considerable period. C. P. Henderson will remain in complete charge of the Cole sales organization, retaining his position as a director of the Cole Motor Car Company, although one of the principal stockholders in the new concern.

Lucius S. French, the secretary, will be in charge of the Henderson advertising. He not only enjoys a wide acquaintance among motor car dealers, but he also possesses a practical knowledge of automobile advertising which has been gained by successful sales promotion work which he has accomplished in the past. The finances will be under the direction of C. K. Share, treasurer, formerly treasurer of the Willys-Overland Company, and a recognized authority on automobile office systems.

Fred E. Wilson is the new Henderson sales manager. He formerly held the same position with the Marion Motor Car Company and is well known by dealers throughout the country. The Henderson factory is to be operated on a system which was perfected by Factory Manager Charles A. Trask, formerly director of one of the largest plants of the General Motors Company. He has only just returned from an extended trip abroad, studying automobile manufacturing plans in Continental Europe and in the British Isles. He also is quite prominent in the Society of Automobile Engineers, being chairman of the committee on papers.

Chester S. Ricker, the chief engineer, is one of the most prominent motor car engineers in the country. He has taken an active interest in the S. A. E. work during the past year, having read a number of papers before that society. Perhaps he is best known as a technical expert, and the articles on motor car construction from his pen have attracted much attention both in and out of the industry.

The advantages of an energetic and harmonious organization have been demonstrated by the Hendersons in the past, and their success has been due, in a large measure, to the fact that every member of the force was a specialist in his respective line. This policy is noticeable in the enlarged concern. The new car will be shown to the public for the first time during the progress of the 500-mile race on the Indianapolis motor speedway, May 30. It will sell for a moderate price, and is claimed to be the only one produced in Indianapolis selling for such a figure.

SPLITDORF CONCERN EXPANDS.

Additional Capital Brings About Reorganization of Established Company for $3,500,000.

The entire automobile industry is interested in the announcement of the formation of the Splitdorf Electrical Company, duly incorporated under the laws of New Jersey, with a paid-in capital of $3,500,000, which will take over the business heretofore conducted under the name of C. F. Splitdorf, Inc., at Walton avenue and 138th street, New York City. The concern is an entirely new organization with a stock issue of $1,500,000 in seven per cent. cumulative preferred shares and $2,000,00 in common stock. John F. Alvord, president of the Torrington Company, Torrington, Conn., is direct sponser for the new corporation and becomes its president, while Charles F. Splitdorf has been elected vice president.

C. F. Splitdorf, Inc., is one of the best known concerns in the industry. The growth in the production of Splitdorf magnetos, coils and spark plugs has been decidedly marked, and in the face of strenuous competition has made its impression upon the European market as well as at home. It may be stated in passing that the name of Splitdorf has been connected with electrical devices of one nature or another for over half a century. It is hinted that still other electrical fittings for automobiles are to be expected from his inventive genius in the near future.

The Torrington Company is closely identified with a number of concerns, each with factory facilities in Torrington, Conn., in the manufacture of various automobile accessories, motorcycles, etc. Windshields, carburetors, motor boat engines and similar fittings have been manufactured by it, or its associates, for a number of years. The combination of these interests with those of the Splitdorf laboratories is of distinct importance.

No radical changes are contemplated, for the present at least. As has been stated, Mr. Alvord becomes president and Mr. Splitdorf, vice president, of the new organization. Bryant S. Keefer has been elected treasurer and Carlos W. Curtiss, secretary and general manager. These officers and John R. Viles will constitute the board of directors.

THOMAS COMPANY HEADS.

Since the reorganization of the E. R. Thomas Motor Car Company, Buffalo, N. Y., maker of Thomas cars, something over a year ago, the aim of the officials has been to bring about a strong organization of men, able to work together in complete harmony. It has been maintained that in the automobile business nothing is of greater importance than the personnel of the factory executive heads.

The reason for this lies in the rather complex nature of the business with its numerous departments, such as engineering, stock, purchasing, manufacturing, accounting, financing, advertising, sales, service, etc. Each requires a capable supervisor to maintain a high standard of excellence and from all is demanded the fullest co-operation in order to secure the necessary unity of action.

Accompanying photographs present the leading executive heads of this institution, each of whom has had many years of experience with the best known makers of high grade cars in America.

F. R. Humpage. Pres. & Gen. Mgr.
J. L. Sugden. Advertising Mgr.
W. J. Birmingham. Factory Superintendent
J. J. Ramsey. Secretary & Treasurer.
W. L. Gleason. Asst. Gen. Manager.
F. H. Trego. Chief Engineer.
Geo. Fitzsimmons. Sales Manager.

Officials and Department Heads of the E. R. Thomas Motor Car Company.

SUCCESSFUL TIRE SALESMAN.

A particular instance in which a salesman has won deserved promotion after several years of earnest endeavor to prove his worth to the concern with which he is connected, is that of John H. Kelly, recently appointed sales manager of the Republic Rubber Company, Akron, O., maker of Republic tires. Mr. Kelly was for nine years manager of the Chicago branch of the company, the business of which grew under his direction until it was second in importance only to that conducted by the home office, itself.

John H. Kelly, Sales Manager, Republic Rubber Company.

He is decidedly well known in the motoring world, largely because of his connection with the reliability runs and hill climbs conducted by the Chicago Motor Club, of which he is a member. In fact, his acquaintance is much wider than the industry, as for 14 years prior to his connection with the tire business he was actively engaged in the sale of bicycles. As member of the Cycling Club of Chicago he was particularly enthusiastic in promoting this cause, pushing his wheel over most of the highways of northern Illinois in the interests of good roads and the mount which he represented.

Soon after becoming identified with the Republic Rubber Company, as manager of the Chicago branch, Mr. Kelly joined the Chicago Automobile Trade Association and a little later was selected as one of its directors. As was true of every endeavor with which he became identified, this association received his very best effort. Undoubtedly, while the members will join with many others who know him, in congratulating him upon securing added responsibilities in his new field, they cannot help regretting that his removal to Akron will result in a distinct loss to motoring activities in Chicago.

HEADS MARION COMPANY.

Official announcement is made of the reorganization of the Marion Motor Car Company of Indianapolis, Ind., negotiations which have been under way for some weeks having resulted in the signing of the necessary agreements. The capital of the concern has been increased from $100,000 to $1,125,000, with $625,000 common stock and $500,000 preferred.

J. I. Handley, President Marion Motor Car Company.

Under the terms of reorganization J. I. Handley, until recently vice president of the United States Motor Company, becomes president, and the major portion of the stock is owned by him and John N. Willys, president of the Willys-Overland Company of Toledo, O. It is stated, however, that the new concern is in no way connected with the manufacture of Overland cars, or with the American Motors Company, with which it will be remembered Mr. Handley was long connected as president.

The Marion Motor Car Company, which has been closely identified with the Overland interests for some time past, now becomes an absolutely independent and self-contained organization and will continue the manufacture of two models of touring cars. Within a few weeks, it is expected that President Handley will announce a strong personnel of Marion officers, which, it is understood, he has been recruiting from the ranks of his competitors. In addition, it is stated that plans are under way for the construction of another large and modern plant in connection with that now owned in Indianapolis.

CROXTON COMPANY EXPANDS.

The Croxton Motor Company, maker of motor cars, taxicabs, etc., with present factory at 2260-2264 East 69th street, Cleveland, O., has plans prepared and is receiving bids for the construction of an entirely new plant at Washington, Penn., which it expects to occupy Aug. 1. The concern will reorganize, taking out a charter under the laws of Pennsylvania, to be known as the Croxton Motor Car Company, with capital of $300,000. J. P. Stoltz, president and general manager, will retain his positions. The new directors from Washington will be as follows:

John H. Donnan, vice president of the Citizens National Bank; A. M. Linn, president of the First National Bank; A. C. Warne, treasurer of the Washington Trust Company; J. B. Bigger, director of the Real Estate Trust Company; C. S. Caldwell of the A. B. Caldwell Company; G. W. Dudderar, managing secretary of the Washington Board of Trade, and J. I. Brownson, attorney at law and director of the Washington Trust Company.

UNITED STATES RUBBER PLAN.

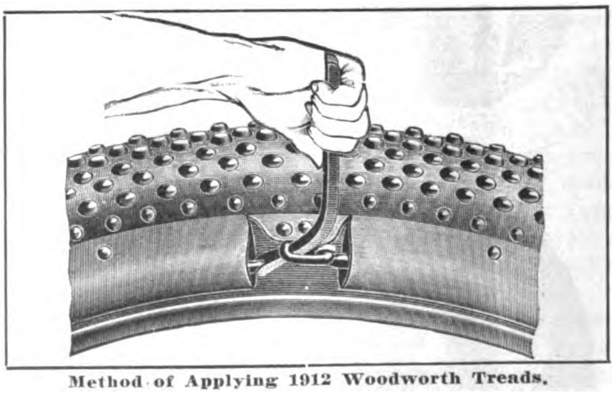
At the annual meeting of the United States Rubber Company in New Brunswick, N. J., May 22, President Samuel J. Colt reported that the company found it desirable to increase its cash capital by $10,000,000 to finance manufacturing extensions and to take care of increased production. The plans suggested called for a total authorized capital stock of $120,000,000, instead of the present $75,000,000, this to be divided into $40,000,000 common and $80,000,000 preferred shares. The increase will be represented by $15,000,000 common and $30,000,000 preferred, the distribution to be as follows:

A dividend of $5,000,000 of the new common stock to present stockholders which would be at the rate of 20 per cent. of their present holdings. Ten million dollars of first preferred to be offered ratable to all stockholders at par and accrued dividends. To submit an offer to the holders of the present second preferred issues to exchange their stock for the new first preferred on a basis of 100 shares of the existing second preferred for 75 of the first preferred.

NEW WOODWORTH TREADS.

The Leather Tire Goods Company, Niagara Falls, N. Y., has made several improvements in its well known Woodworth treads. The method of holding with coil springs is retained with the springs made much longer than formerly, so that only six or eight are used on each side of the tire. This makes it possible to connect them much quicker than formerly. The hooks on the ends of the springs are made of separate pieces of metal, inserted in the coils so that they can be adjusted by screwing in or out. This new hook takes the place of that formerly made from the end of the spring. With the tread a tool is furnished which enables one to hook the springs in one motion, the method being shown in the illustration. The great advantage of the spring method of fastening is that the tread is always kept tight to the tire, and cannot get loose to rub and chafe the rubber.

Besides the improved fastenings, the 1912 treads are made of leather finished by a new process by which it is prevented from becoming hard and cracking. The middle rivet heads, where the greater portion of the wear comes, are carefully tempered, and are so hard that they will give double the usual amount of wear. The treads are guaranteed by the maker not to injure the tire, with the agreement that if, when used according to instructions, they should do so, the Leather Tire Goods Company will replace it by one the same make. The company has prepared a new indoor hanger and an outside advertising sign.


Method of Applying 1912 Woodworth Treads.

TRUCK SALESMEN "KILL" PROSPECTS.

Argument Condemning All Other Machines Often Used, Creating Distrust of Inquirers and Resulting in the Rejection of Vehicle Seriously Considered.

The greatest enemy of the motor vehicle industry, especially that division producing service wagons, is the agent or salesman who essays to strengthen his argument by direct or indirect statements derogatory of the machines produced or sold by rivals. It is believed by many that salesmanship consists chiefly in analyzing another automobile, car or wagon, and emphasizing what are maintained to be errors in design, faults in construction, inadequacies in material and poor workmanship, as well as inefficiency in actual use. The seemingly prevailing opinion is that the creation of distrust in the mind of a prospective purchaser with reference to all other vehicles of the same class is a sufficient reason why those machines should be rejected and that under consideration should be accepted.

This statement may appear sweeping, but it cannot be too strongly emphasized. While it is essential first of all that a salesman should be thoroughly informed of every mechanical detail, every purpose of design, every fact relating to service of the vehicle he sells, it is not to be assumed that he will know other machines as well as that in which he is directly interested. He would indignantly resent a statement that rival salesmen knew as much or more about his car or wagon as himself, yet he deliberately creates the impression that he knows all other motor conveyances equally well. In assuming this attitude he justifies it by statements that are either economies of the truth or exaggeration of fact, or declarations without reflection and prompted by ignorance of mechanics.

Engineers are agreed as to certain established principles but there are few so rash as to condemn that of which they have little or superficial knowledge, but with the supreme confidence born of ignorance the salesman proceeds systematically and deliberately to discredit the vehicles sold by competitors. From every aspect and angle he endeavors to establish weaknesses and faults. He deals with conditions of which he has extremely limited knowledge and asserts personal experience. He describes the differing services and what may be accomplished. He always deals with extremes. He is not satisfied with an average or conservative requirement or result. There is never wear and there is the minimum of economy. He can accomplish what may apparently seem impossible undertakings and without reaching limitations.

The salesman meets all manner of hypothetical questions as nonchalantly, and he is certain of any statement made. He points out that the driver, perhaps without experience, can cope with any situation that may arise. Nothing is impossible, resources of mentality and facilities are ample and always available, and everything that may happen will be met with under circumstances that are always favorable. But with any other conveyance there is a complete reversal of conditions.

The purchaser may be impressed, but not convinced, and he makes inquiry of others selling the same class of machine. His surprise may be judged when he hears each vehicle lauded by the salesman and all the others, including that he lately investigated, roundly condemned. The good business man is a wise listener. He asks questions and learns that every other motor wagon built is junk and in every way unserviceable. They are defective and inefficient and valueless, and if one is in condition to operate it is the exception, not the rule. In many instances one may merely change the names of the vehicles and of the competitors, to establish the really satisfactory machines, and the arguments are alike.

As the prospective buyer learns that every machine he considers is the only dependable and reliable transport, that all others are worthless or unreliable at best, it is not strange that he forms the opinion there is not one in which he is justified in making investment. Instead of buying he decides to wait and observe results, a very natural conclusion, entirely justified by the character of information he has received.

The primary fault is with the manufacturer who tolerates this manner of selling. His own business interests should impel the education of his representatives to the fullest extent necessary to demonstrate machines and sell them. He ought to have personal knowledge of the methods of those selling his products, and there is no good reason if he does not. The agent selling the machines cannot afford to have novices as salesmen. It is necessary that he employ the most capable and well balanced men he can engage, because they are dealing, if with service wagons, with men of affairs and with large propositions. They must make consistent statements and give logical reasons for every conclusion reached. They must serve as advisors, and be capable of analyzing existing methods of haulage and devise means for using the machines to obtain the largest measure of their superior speed and capacity. They must be able to grasp a situation and apply to it practical methods, and know how to utilize men to secure the most productive results. They ought to have knowledge of service of similar character, and they should be competent to suggest the manner of maintenance and care that shall be the most economical.

Such salesmanship cannot be expected from boys or drivers, nor from those who have no experience with business. What might be acceptable in one instance might be exactly reversed when applied to another. Each prospect presents new phases, which demand different applications of the uses of the wagons. The man who knows is seldom willing to make unqualified assertions, and the better informed he is the more careful he is in his comment.

The man who is a good salesman never has reason to discredit another machine. He is able to so present the qualities of what he is describing that these are impressed upon the visitor. There is no weakness in solid facts and under any circumstances there is nothing to be gained by making extravagant and unfounded claims. The man who can say good things of his competitors is losing nothing. He has nothing to retract nor to regret, and his statements carry conviction. Honesty of speech is as essential to business success as is honesty in dollars and cents, and it is just as valuable an asset as cash when dealing with the man who wants advice by which he can improve his service and incidentally further his own prosperity.

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THE NEED FOR SYSTEM.

One of the newer vocations is that of the business systematizer, the man who installs in a business house a system of records and accounts which enables cost to be calculated to a fraction of a cent, with every detail which contributes to the making up of that cost accurately known. The large firms found that they could not work blindly in the dark, being satisfied if they obtained a profit and raising prices when the profit did not appear. They had to know the details of cost so that reductions could be made where possible, and leaks eliminated. Just as system is required for a large business, so is it necessary for a small house.

There is no need for a complicated system such as is demanded in a large factory, but every garage should have some means of keeping account of work done in the shop, and of supplies and parts used. Charges on a given job are based upon the time and supplies consumed, and there is nothing more uncertain than the memory of the average repairman where these two things are concerned. Interested in his work, he forgets time, and in the end it is guessed at. Gasoline and oil used are forgotten, and bolts, nuts and cotter pins are too small to count. The only remedy is a system which is simple and yet will keep forever after the workman making him record every moment he puts in on a job, every pint of oil or gasoline, and every part down to the smallest piece of wire.

THE APPEARANCE OF THE GARAGE.

Storekeepers have long realized that the appearance of their establishments counts greatly in securing trade. The public goes to the well lighted attractive stores which use plenty of white paint and electric lights, while it refuses to visit the man who continues in an ancient and dusty atmosphere. The garage is but a store, though it sells service more than merchandise, and like the latter that which presents the most attractive appearance wins the most trade.

There is many a garage which could be made attractive by the expenditure of a comparatively small amount. A coat of paint on the front improves the looks of a place a hundredfold and in customers attracted may pay for itself in a week. The improvement should not be confined to the outside, however. Inside, the walls should be painted, or at least whitewashed, the grease and dirt scraped off the floor, and the corners cleaned of their miscellaneous collection of useless parts and dirty waste. A neat attractive shop spells clean work to the owner, while he hesitates to patronize the man who pays little attention to appearances.

THE MACHINE TOOL DEPARTMENT.

Many garages have had the experience of seeing a steady customer go to another to have a difficult job done—and never come back. If work that cannot be handled is turned away, that which can be done is very liable to go too. It is possible to sell a man gasoline and oil, patch his tires and grind his valves with great success, with the result that he is perfectly satisfied, but when he finds he cannot get the frame welded or step attached because the garage has neither a welding outfit nor a drill press, he will change his opinion, and the man who can do the work he wants will get it all.

It once was true that when a part on an automobile broke it was scrapped and a new one was bought from the maker, so that all the dealer had to do was to fit it. Now the garage is expected to be able to repair the part, or make a new one. This calls for a complete machine equipment. In fact, many machine shops have found it quite profitable to install an automobile repair department and have become direct competitors of the regular repair shops, with decidedly successful results.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Firing Order of Motor.

(64)—Will you explain why a four-cylinder motor fires 1, 2, 4, 3, or 1, 3, 4, 2? I would like to know why the explosions take place in these orders instead of 1, 2, 3, 4. WILLIAM SHAKESPEARE.
Waltham, Mass., April 28.

The object of a four-cylinder motor is to produce power by a series of impulses of frequent occurrence rather than a lesser number of stronger explosions. The arrangement of the components is such that while one cylinder is firing, those next in order are compressing, exhausting and inspiring a fresh charge respectively, and at the end of the power stroke, the piston that has just compressed is ready to transmit the power produced by the explosion of the gas and keep the crankshaft revolving.

The construction of the crankshaft of a four-cylinder motor is such that two pistons are up while the other two members are at the bottom of the stroke and the explosions instead of occurring simultaneously during one stroke, and then waiting till three idle strokes had taken place before repeating, are spaced equally, one occurring each half revolution of the crankshaft in the following order, for example, 1, 2, 4, 3. As two pistons are going up while two are going down, the parts are mechanically balanced, one set of moving parts weighing exactly the same amount as the other.

With the motor firing as above referred to the piston of the No. 1 cylinder would be at the top of its stroke ready for firing. That of the No. 2 cylinder would be at the bottom of its stroke or ready to compress its charge of mixture. The piston of the No. 3 cylinder would also be at the bottom of its stroke, but about to expel the burnt gases on the exhaust stroke. The piston of the No. 4 cylinder would be at the top of its stroke about to descend for the intake of the mixture. When exploding 1, 3, 4, 2, the only difference is that the No. 2 cylinder is exhausting and the No. 3 compressing, or reverse to that of the firing order 1, 2, 4, 3.

Making Asbestos Gaskets.

(65)—In overhauling my ——— car I spoiled the asbestos gaskets used between the exhaust manifold and cylinders. The bolt holes are very close to the edges of the manifold and in trying to fit the gaskets have broken a large number, as the asbestos crumples and tears easily. Have tried several ways without success. Can you suggest some way to make them without using up considerable of the material? J. V. D.
Houston, Tex., April 30.

Asbestos, especially if thin, is difficult to handle unless one be familiar with the material. As the manifold is of iron the gaskets may be made easily by taking a piece of asbestos of the desired thickness and slightly larger than the manifold. The asbestos is then placed upon the latter as depicted at Fig. 1 and held securely while the sharp edges of the metal, as shown by the dotted lines in the drawing, are tapped lightly with a ball pein hammer. The blows will cause the metal to cut through the asbestos so that the gasket proper will be separated easily from the piece.

In cutting out gaskets for aluminum members care should be exercised, as the metal is broken easily. In fitting these gaskets they should be smeared with a paste composed of powdered graphite and oil which will enable their removal without damage, thereby saving the trouble of making new members. If more than one gasket is essential for the same port member, because of any variation of the manifold, the members should be cemented together with shellac and the graphite utilized on the exterior surfaces, as previously outlined.

Series and Multiple Series Wiring.

(66)—I have noticed reference made to series and multiple series methods of wiring batteries, and that when dry cells are wired in multiple more current is obtained and that it is the best way, as it is cheaper. Will you kindly explain the difference between the methods and why more electricity is secured? CHARLES KENYON.
Portland, Me., May 3.

A single dry cell of standard construction is capable of developing only 1.5 volts and has a capacity ranging from 15 to 23 or more amperes, the amount varying according to the make. It may be explained that the voltage represents the strength of the current and the amperage the flow or amount.

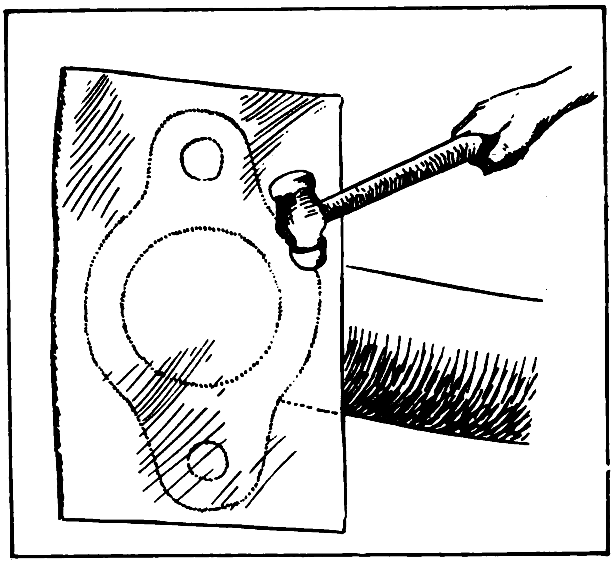


Fig 1—Outlining Method of Cutting Out Asbestos Gaskets with Ball Pein Hammer.

If voltage be desired, for example, six or eight volts for operation of a coil utilized for ignition purposes with the motor car, a number of cells would be connected together by what is known as a series connection; that is, so that the current flows through the cells in succession each increasing the voltage of the preceding cell by an amount equal to its own voltage. Thus six cells wired in series as depicted at the top of Fig. 2 would give six times 1.5 volts or nine volts. Connecting cells in this manner does not increase the amperage or quantity of current, but rather decreases the amount as the resistance is increased by the series connections, cutting down the current flow.

To increase the rate of current flow, the cells are connected by what is termed parallel, in which all of the zinc terminals are connected in one group, and the carbons in another, each terminal wire being connected to all of the battery terminals of the same kind as indicated in the second row. When cells are thus wired the voltage is the same as of a single member, but the amperage is increased by an amount equal to the product of that of one cell multiplied by the number of cells. Single members, or groups in series, may be connected in parallel, and these groups may be considered a single cell of large voltage.

When series groups are in parallel the combination is known as series parallel or multiple series. This arrangement is shown at the bottom of the illustration in which three groups of four cells in series are depicted connected in multiple. The total voltage in this instance is equal to that of four cells in series, or four times 1.5 equals six volts, and the rate of flow is equal to three times that supplied by one series group. If the cells be connected to an outside circuit requiring a given amount of current, the demand on each battery is one-half of that on a cell in a single series group.

The advantage of the multiple series is that the demand on the individual cells is reduced thereby increasing their life, and at the same time the desired voltage is obtained. The efficient output of a single group of cells in series is usually limited to one-quarter ampere, and by placing two such groups in parallel it is possible to secure double this value or one-half ampere, and with but one-half the demand upon the batteries. The greatest efficiency from dry cells is obtained when the lowest discharge rate in amperes is obtained. Any number of cells may be connected in multiple series and by increasing the groups of series the service will be augmented proportionately.

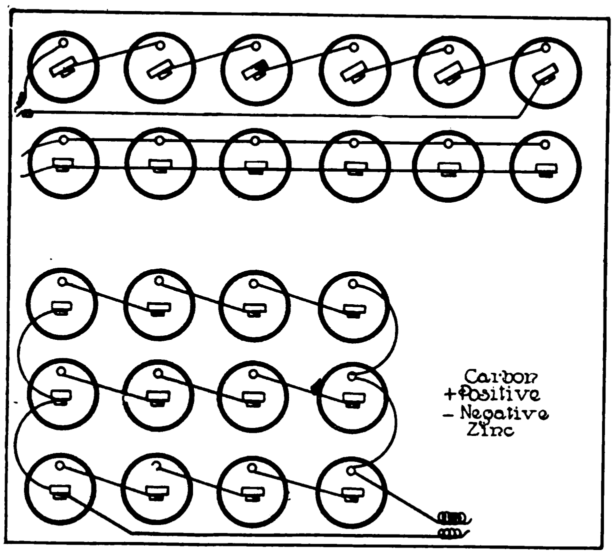


Fig. 2—Explaining Wiring of Dry Cells, Six Being Connected in Series; the Same Number Wired Parallel, and 12 in Multiple Series.

Lubrication of Motor.

(67)—Please inform me which is the best make of oil to use with an automobile engine? I have a Ford car and last year used a standard make of lubricant. This year I purchased a cylinder oil less well known. Do you think it is a better oil for a Ford machine?

ELIZA B. HART.

Princeton, Mo., April 24.

It is poor policy to change from a recognized high grade oil to a new product because of its attractive price, as the experiment may prove costly. It may be pointed out that the difference in cost at the end of the year will amount to a few dollars at the most, while on the other hand, should the new lubricant not perform its function properly, the repair bills would be greatly in excess of the net cost of the highest priced lubricant on the market.

It is poor economy to experiment with lubricants, and it will be noted that every manufacturer recommends the use of a recognized standard oil for his motor car. The experienced automobilist is not misled by the attractive literature and prices of unknown concerns, and adopts a high grade lubricant and continues its use thereby effecting economy.

Representative manufacturers of lubricating oils have conducted exhaustive experiments and tests to ascertain the best grade of lubricant to meet each and every individual requirement, be it for automobiles, motorcycles, motor boats, aeroplanes or stationary engines, and this information dealing with every make of automobile will be mailed free upon application. The product of these makers is sold in cans or barrels bearing their name and trade mark and the buyer is thus assured of protection in purchasing. By referring to the Classified Buyers' Guide in the Accessory and Garage Journal, the names and addresses of the leading representative makers of cylinder oils and lubricants may be ascertained.

Starting on the Switch.

(68)—Will you please explain the following to me? I have a scheme for starting up an old car without cranking it. I am thinking of connecting some batteries to my sparker. I can also add a push button for each cylinder. Then I can push a button and get a spark in any cylinder, so if I catch one with compressed gas, the engine will start. If I pushed the button on one that had not reached centre, it would start her backwards. Would this do any harm? Or, if I fired on dead centre, would it burst the water jacket or do any other harm to the engine? Is there a system like this on the market? J. M. HAIR.

St. Albans, Vt., May 1.

Adding a push button and proper connections at the magneto or batteries so as to produce a spark in each cylinder should start the engine, but if this produces only one spark, it must be connected with a form of distributor to have it always occur in the one containing the compressed gas.

Even if the engine should start backwards, nothing can happen, and by shutting off both spark and throttle it will soon come to a stop. Then another start can be tried.

Trouble With Axle Dishing In.

(69)—Will you please assist me in present trouble? I have been greatly annoyed by the appearance of the back of my car, which appearance is caused by the rear wheels leaning in at the top very much. This gives the car a "knock kneed" look, which I do not like and want to fix, if I can. I doubt if the car looked that way when I first obtained it, about a year ago.

LEON W. KUHN.

Canaan, Conn., May 2.

The trouble is depicted graphically in Fig. 3 herewith. This shows that the dishing in or "knock kneed" appearance of the rear wheels is due to the sag of the rear axle at the centre. In substance, the axle tubing with the truss rod below has not been strong enough to withstand the severe usage it has received on the road.

Normally, the wheels should stand vertically, as shown by the centre line B B, or else, they may have dished outward slightly as indicated by the line C C. As A A is the present centre line, the difference between the three lines at the road surface (or at the top if you prefer) shows the urgent necessity for adjustment.

The truss rod below is there for this purpose, and must be shortened, thus pulling the ends in, straightening the axle housing and also straightening up the wheels as they should be. To proceed with this work: Back off the locking nuts on the turnbuckle adjustment so it will be free to move. The two parts of the rods are threaded in opposite directions, one right hand the other left.

When the turnbuckle is rotated with a wrench, after jacking the entire rear axle up off the floor, of course, this draws in both sides at once. A square should be built with about a 12-inch base and a long enough vertical leg to reach to the top of the tire. Set this against the bottom of the wheel and measure the distance to the top before starting to adjust. After about one full turn, measure this again. Continue in this manner, until the centre line position B B is reached. You can use your judgment about proceeding to give it a slight outward dish at the top to the position C C. The advantage of this follows: If the sag of the axle continues after adjustment, considerable of it will be already provided for; that is, considerable of it can take place before the wheel position comes past a vertical.

In the sketch, the relative positions have been greatly exaggerated to bring out the point. If the rear construction is in as bad shape as this shows, it should not be tackled by the amateur, but sent to the factory.

Auto Signalling Code.

(70)—Will you please advise me if there is such a thing as an accepted code of signals for use in touring or driving in an automobile? By this, I mean is there any signal which is recognized all over the country as meaning the same thing, so that it could be used with safety all over? DEWITT R. DOOLITTLE.

Hartford, Conn., May 3.

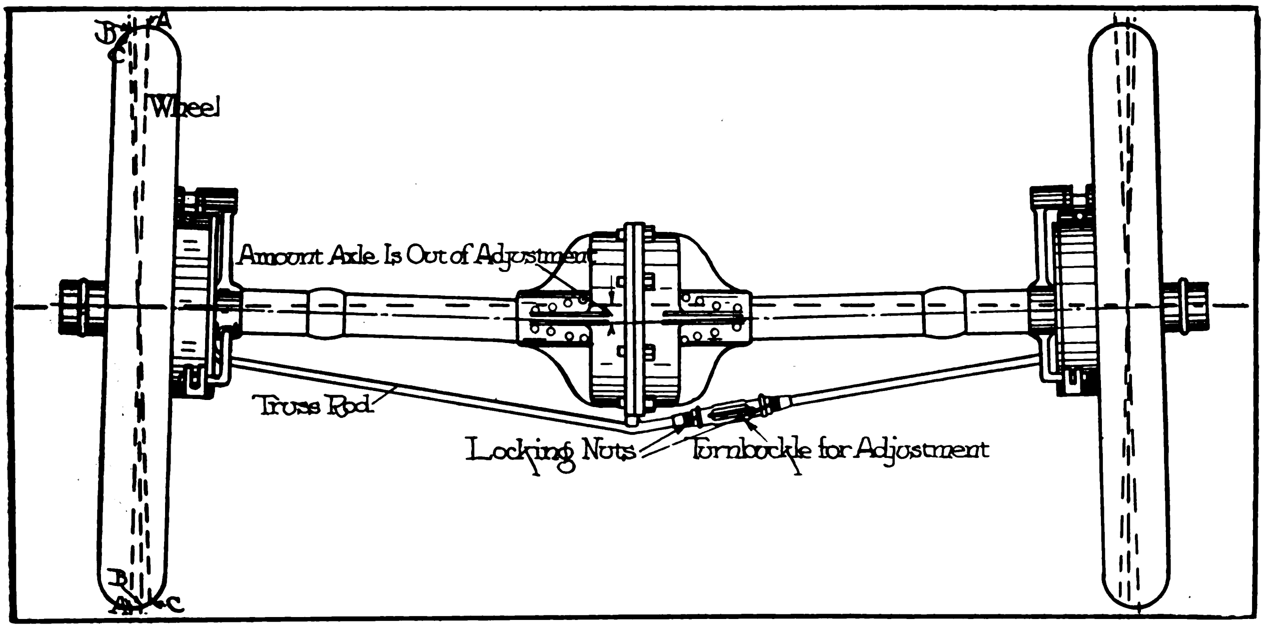


Fig 3—Sagging Rear Axle, Bowed Wheels Resulting, and Method of Adjusting the Same by Truss Rod.

While it cannot be stated with absolute certainty that any one code is used all over the country, a list of signals adapted from boat signals is here given, which is believed to be used over a large portion of the eastern part of the country. A sign which is very general throughout the East, is the horizontal extension of the right arm at full length to indicate to a car behind that the driver is about to stop or slow down. The adaptation from the boat code follows:

Auto Signalling Code.

(1)	When running ahead and going to make port or to stop.	One long and one short blast of horn, to be sounded not less than 30 yards from stopping point.
(2)	When coming to a standstill, or have made port.	One short blast.
(3)	Going to start ahead, or leave port.	Five short blasts.
(4)	When standing still and going to back up.	Two short blasts.
(5)	Starting ahead slow on bad roads, slippery or muddy.	Three short blasts.
(6)	Going to turn to left at road crossing, to be sounded before starting to turn.	Four short blasts.
(7)	Going to turn to right at road crossing.	Two short and one long blast.
(8)	In passing a slower car on port side (left).	Three long blasts.
(9)	In passing when abreast on port side.	One short and one long blast.
(10)	When crossing intersecting roads, signal must be blown at least 20 yards distant from crossing.	Two long and two short blasts.
(11)	Coming to forks of road, if any cars, teams, vehicles coming in opposition use marine signal code; will turn to left; always keep on right side of roadway.	(Starboard) Two long blasts.
(12)	Calling for assistance if stalled on the road.	Five long blasts.

As a suggestion, motorists who have done considerable touring are asked to write this office relative to the above, giving their views and experiences, so that a satisfactory and fairly universal signalling code of this nature can be compiled, using this one as a basis.

Question of Compensation.

(71)—Please inform me what it is worth to take care of an automobile in the owner's garage, the work involving washing, polishing, replenishing the supply of fuel and oil and inflating tires when needed? E. L. TRAVIS.

Washington, D. C., April 28.

There are a number of conditions to be considered, such as how many times the machine will have to be washed and polished and how particular its owner is as to its appearance, also how much service will be required. Garage charges vary from $5 a month for dead storage, where the owner takes care of his own machine and pays for the washing and polishing, to $30 a month for full care. The price for the work mentioned varies from $1 for a small runabout to $2 for a large machine. Charges for live storage are $15 upward, depending upon the size of the automobile and location of the garage; that is, in some cities the cost of garaging is considerably more than others. Regarding the salary, this would appear to be a subject in which the owner would be interested as well as the caretaker.

TO ENRICH GASOLINE.

Acetrol is shortly to be placed on the market by the Acetrol Company, which was recently formed in Milwaukee, Wis., by P. C. Avery of the Avery Portable Lighting Company, maker of the Electrobola lamp. Acetrol is a chemical compound which is to enrich gasoline by producing acetylene, it is said.

WHO'S WHO IN THE INDUSTRY.

EDENBURN WITH REMY COMPANY.

The predilection of the Remy Electric Company, Anderson, Ind., maker of Remy ignition and lighting equipments, for newspapermen is made still more evident by the enrollment of W. D. Edenburn as publicity and assistant advertising manager. This is the sixth graduate from the news gathering field which has been added to the Remy force, and he is by no means the least known of the six.

W. D. Edenburn, Publicity Manager, Remy Electric Company,

Mr. Edenburn goes to the Remy people from the Indianapolis Sun, where he was manager of the automobile department. He was formerly automobile editor of the Indianapolis Star, where appeared many of his expert articles on racing, shows and other features of motor car activity.

Last summer Mr. Edenburn was closely associated with the Indiana Automobile Manufacturers' Association, and one of the active promoters of the idea of the Four-States tour.

WILL EXPLOIT COLE CARS.

The accompanying illustration is that of Homer McKee, who has been appointed to succeed Lucius S. French as general manager of the Henderson Motor Sales Company, Indianapolis, in full charge of the advertising of Cole cars. As is well known the Henderson company is general distributor for the product of the Cole Motor Car Company of that city.

Homer McKee, General Manager, Henderson Motor Sales Company.

Mr. McKee has been a writer of automobile copy for a number of years, and his work has attracted unusual attention at the New York and Chicago shows. His style is intimate and his understanding of the demands of the industry broad in its scope.

Furthermore, he has had extensive newspaper and magazine experience, and is recognized as one of the best known men in the advertising business, particularly with motor cars.

Few American machines have had the benefit of more efficient exploitation than the Cole. Mr. McKee brings to his new position, not only an intimate knowledge of his chosen field and the Cole car, but a wide circle of friends and acquaintances who will join in congratulating him and the Henderson Motor Sales Company upon his selection to carry forward this work.

PERFECTED REMY MAGNETO.

The accompanying illustration is that of I. J. Reuter, chief engineer of the Remy Electric Company, Anderson, Ind., to whom the company gives credit for developing and perfecting the present type of inductor magneto made by this concern. He succeeded President B. Perry Remy as engineer previous to the sale of the Anderson Electric Company.

I. J. Reuter, Chief Engineer Remy Electric Company.

The new RD type of inductor magneto, bearing the Remy name, is the result of Mr. Reuter's genius. He has improved and refined the product of the company in many ways, among which may be mentioned the use of Bakelite instead of hard rubber for insulating material. He also has reduced the size of the instrument without decreasing its efficiency. Another improvement is the substitution of ball bearings, and one of his latest achievements is the new vibrator coil, especially adapted to self-starting devices, by means of which a shower of sparks is shot into the cylinder about to be fired, instead of the usual single spark.

Mr. Reuter was at one time designing engineer for the Willys-Overland Company, Toledo, O., and is more or less well known in the industry. He graduated from Purdue University in 1906 and is a member of the Society of Automobile Engineers and of the Indiana section, S. A. E.

GRAPHITE FOR INNER TUBES.

According to "Graphite," an excellent substitute for talc or soapstone as a lubricant for inner tubes in shoes, is flake graphite. Being chemically inactive, it is claimed to have no deleterious effect upon rubber, is more lasting than soapstone, effectively prevents chafing and heating of the tube and helps to make the fit more snug in the casing.

UP-TO-DATE Machine & Tool Equipment

The quality of work turned out by a garage is dependent upon the machine and tool equipment of the repair shop no less than upon the ability of the repairmen. While some men, given a hammer and a wrench, and with a lathe at their disposal, can make almost any repair that comes into the shop, they are rare, and work performed under such conditions is bound to result less favorably than when ample facilities are provided.

Today, when automobilists are demanding more accurate and exact work from the garage, and are bringing in jobs that were formerly considered hopeless and beyond repair, the repair shop must be thoroughly equipped to do all kinds of machine work if it is to secure and retain trade. It is the garage with the best equipment that gets the big jobs.

If a man has a job of welding, and the garage where he has been buying his gasoline has no welding outfit, he may be expected to hunt up a place where he can get the work done. As a result, the first shop not only loses the profit on that particular piece of work but places itself in a position to lose the man permanently. It is not good business policy, other things being equal, to turn any work away as the customer may find some other establishment which can and will do all his work. It is because of the necessity for keeping old customers, as well as obtaining new ones, that the outlay for modern machine equipment must be considered.

When viewed from the standpoint of first cost, many men think that the expense of some machines is too great, and that the automobile trade of the vicinity will not be sufficient in the particular line of work which the machines perform to warrant the expenditure. This is often, in fact usually, a mistaken idea, and the garage proprietor has not seen the full field from which he may draw custom. There is no especial reason why a drill press in a garage should work on automobiles only, except that the owner does not go out after any other class of work.

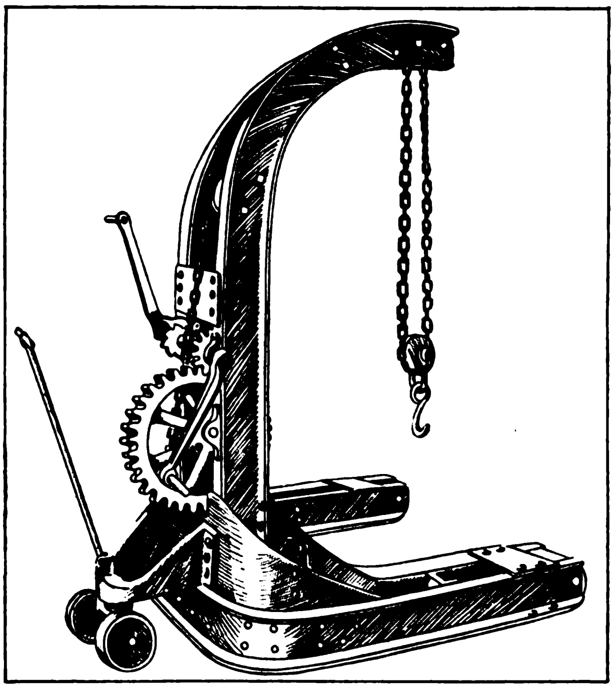
A garage with a good machine equipment is fitted to do all the work of the modern machine shop, just as the latter can make automobile repairs with great facility. Many a machine shop has found in this class of work a decided addition to its trade, and a few garages are beginning to realize that with a good machine equipment they may find in the usual machine shop work an excellent source of income during the dull months.

Years ago, the blacksmith who repaired a man's wagon forged the braces for his house, made his furnace irons, and repaired his factory machinery. The blacksmith who was content to do his work in the old way, with his comparatively few and simple tools, remained a blacksmith, and today only shoes horses. The man who kept abreast of the times and installed new and improved machinery now owns the machine shop. The garage will follow in the steps of the blacksmith shop and degenerate into a storage establishment and gasoline dispensary unless heed is taken from the handwriting on the wall and facilities provided to keep the trade which is drifting to the machine shops.

With a view to suggesting methods for taking advantage of the opportunities afforded along these lines, this department will describe each month some of the latest and best of the machines and tools which are of value in garages and repair shops.

Portable Crane.

Outside of a lathe, perhaps the most useful device a garage can have is a portable crane. Not only does it save the time and strength of repairmen but it makes possible work that could not be performed by men alone. Motors, transmissions, unit power plants etc., can be lifted out of a car in a fraction of the time that otherwise would be required, without a particle of danger to either the men or the part, and with the minimum of effort. The whole front or rear of an automobile may be lifted several feet in the air, to facilitate repairs. Used in this way, the crane surpasses a repair pit, as it may be brought up to a window or other convenient source of light, while the pit often is found to be too dark. The repairman is also given more room in which to work.



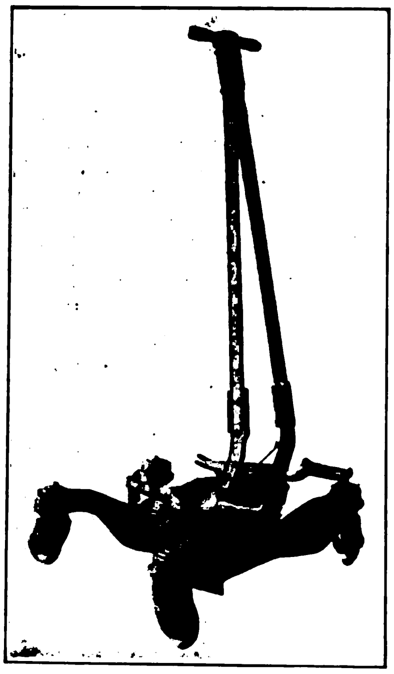
LaFayette Portable Crane.

The LaFayette Engineering Company, LaFayette, Ind., is making a steel portable crane which should prove especially valuable for garage use. It may be operated by one man and enables him to lift the heaviest part unaided. The feet go underneath the chassis and are long enough to render the crane perfectly stable. The overhang is three feet six inches, so that it has sufficient reach to get around a car in almost any position. It is easy to push around even when loaded, as the wheels run on roller bearings. All parts of the machine are of steel, with machine driven steel rivets, so that it is exceedingly strong and durable. The chain is tested to three tons and is wound on a drum by hand, large reduction gears minimizing the effort required. The weight complete is 900 pounds.

Canton Auto Jack.

Two things always found around a garage are a jack and a truck, though the latter is perhaps not as common as the former. With the jack things are raised, and with the truck, carried around the garage wherever desired. Often a machine has to be jacked up before it can be moved, and when so lifted with less difficulty than before only when the jack is provided with wheels.

The Canton Auto Jack, made by the Canton Foundry & Machine Company, Canton, O., is a device of this character, namely, a jack on wheels. It has been designed especially for use under the front or rear axle of a car, and the construction is such that one man can raise weights of from 3000 to 4000 pounds from nine to 21.5 inches. It fulfills the requirements of a jack for garage use in that it is sturdily constructed, capable of lifting heavy weights, adjustable to different heights of axle, simple and fool proof in operation, and may be worked by one man.


Auto Jack Designed for Garage Use.

It will be found particularly valuable in moving cars whose front or rear wheels are disabled, as it may be placed under the axle, elevated a few inches, and the car moved on it and the other wheels with ease. With this jack a machine with either the front or rear axle removed is not immovable, but may be wheeled about the garage by one man, using the handlebar. The lifting ratchets are controlled from this bar, the left hand operating a pawl which is brought into play readily and saves stooping. The handlebar is four feet long, affording good leverage.

The supporting antlers and the stem have heavy square threads, these insuring durability. The long antlers will be noted in the illustration, and are used on the rear axle, shorter members being utilized for the front member. Both are adjustable as to height. When the car is elevated on the jack the wheels may be removed and the car still be pushed around the garage. The device is constructed of high grade material throughout and may be had with either three or four wheels.

Power Drill.

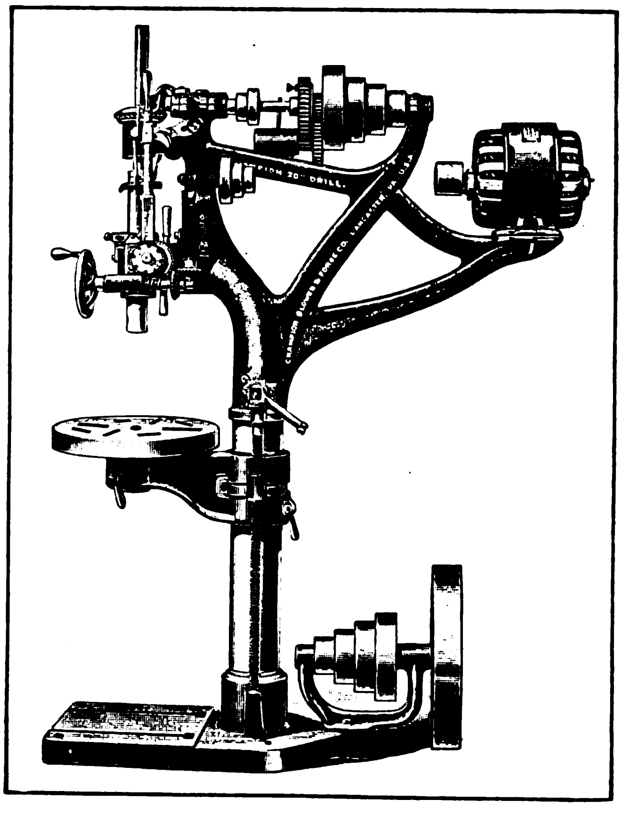
Another decidedly useful machine is a power drill, as those who have tried to drill steel by hand have abundant reason to know. Not all garages have a source of power, however, and in that event a power drill necessitates obtaining such a source, unless it be equipped with electric drive, as is the 20-inch double back geared upright power drill, made by the Champion Blower & Forge Company, Lancaster, Penn., and illustrated herewith. This is fitted with an electric motor, which may be had in various styles to be used on any type of current.

As nearly every garage is wired for electric lights, this drill has an almost universal application, current being taken from a convenient bulb socket by means of the usual plug and cord. The electric motor is held on an arm of the frame, at such distance from the driving pulley that the belt is long, giving an even uniform drive. Control of the motor is easy, being at all times under the direction of the operator without moving from his position at his work, through a switch conveniently placed.

The machine may be used either as a plain drill or as a back geared drill, the change being made in an instant by sliding the gears in or out of engagement by means of a lever. It will drill with perfect accuracy holes up to 1.5 inch, and is simple in operation, yet has all the feeds and speeds and automatic features on much more complicated devices. Eight speeds are provided, with power, hand screw and lever feed. The gears are machine cut and the bearings are large, insuring long service.

The spindle is counterbalanced by a weight in the hollow column, thus relieving the spindle arm of undue strain and making a substantial construction. An automatic stop attachment is provided with a quick return lever, which gives a rapid motion to the spindle. The table is lowered and raised by means of a screw, which is quick in action and self-locking, holding it steady and firm. The handle which operates the screw is conveniently placed.

The drill works to the centre of a 20-inch circle. The spindle is 1.25 inches in diameter and is bored with a No. 4 Morse taper, with a graduated sleeve. The drive is from the motor to pulleys by means of a two-inch belt, the pulleys being of the four-step variety, eight inches in diameter, and with 2.5-inch face. The speed for ordinary drilling is 300 revolutions a minute. A hanger attachment for drilling rims, which will be found very useful about a garage, may be had as extra equipment. The weight complete is 900 pounds.

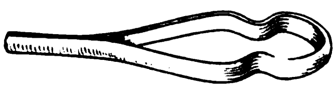

Champion Electric Drive 20-Inch Drill.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

A Self-Spreading Cotter Pin has been brought out by Barthel, Daly & Miller, New York City, and a feature of the device is that ends open automatically, and may be driven into the bolt, nut or other place as one would a nail. This saves time, inasmuch as the ends of the pin do not have to be opened as is the case with the usual members.

Self Spreading Cotter Pin



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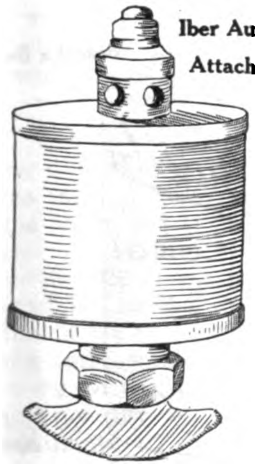
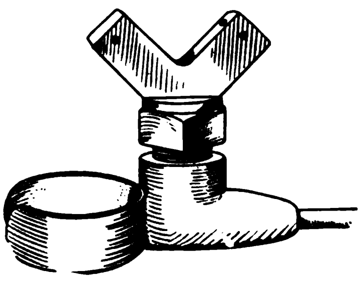
The Iber Automatic Attachment, made by the Motor Attachment Company, Poughkeepsie, N. Y., is a device which operates in conjunction with the carburetor and it is stated by the maker that it will regulate or balance the suction of the pistons when these draw different amounts of mixture from the vaporizer. It is also claimed that a perfect vaporization is brought about, that the intake manifold is always filled with the proper mixture, and that the device automatically operates quickly at low speeds and slowly at high, thereby equalizing the suction on the carburetor. The instrument requires no adjusting whatsoever and may be fitted to any type of standard carburetor. It is held that it will save 25 per cent. of the fuel, increase power and make starting easy. It is applicable to any type of internal combustion engine.



Iber Automatic Attachment

The Ferguson Gas Burner attachment, manufactured by J. Ferguson, 9 West 63rd street, New York City, is a device for converting oil lamps so that acetylene may be utilized. It consists of a burner carrying member, integral with which is a spring like clip and a metal tube. The first named is slipped over the oil burner and does not interfere with its operation. The device is fitted by drilling a .25-inch hole in the side of the lamp and passing the pipe through the opening, allowing about one inch to project on the outside for the purpose of attaching the lead from the gas tank or generator. It is claimed by the maker that the burner consumes but .125 cubic foot of gas an hour and that an ordinary tank will supply three burners for 300 hours. The attachment is fitted easily and is not expensive.

Ferguson Gas Burner



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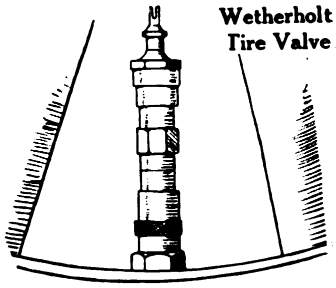
The Wetherholt Tire Valve, produced by W. C. Wetherholt, Columbus, O., is designed to control automatically the pressure of tires and to prevent over inflation. The importance of proper inflation is well known and is usually determined by the use of a separate pressure gauge, the operation involving the testing of the tire after it is pumped. The Wetherholt device is so constructed that in case the tire has been pumped up over the required pressure, or expansion has taken place through friction, the valve will open and release the excess air, preventing the bursting of the shoe. Each valve is set according to the proper pressure of the size of shoe with which it is employed, and tested accurately before leaving the factory. The maker points out that it is a well known fact that in hot weather the pressure increases with friction and that air in a shoe inflated when cool will expand in service. All parts of the Wetherholt valve are interchangeable.



Wetherholt Tire Valve

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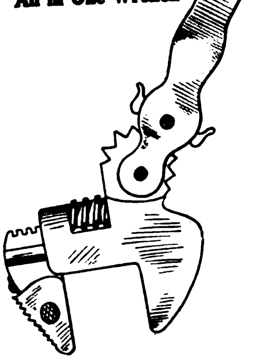
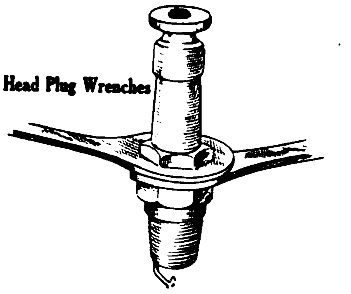
The All-in-One Wrench, marketed by the Universal Wrench Company, Indianapolis, Ind., is a combination tool about nine inches long, constructed of high grade steel and nicely finished. It is fitted with an adjustable jaw which may be employed for removing nuts, etc., and this may be reversed when the service of a pipe wrench is desired. The jaws may be adjusted to eight different angles by means of a ratchet device, which also permits the use of the tool in places inaccessible with ordinary wrenches. It is claimed by the maker that it is sturdily constructed and will withstand all ordinary stresses.

All in One Wrench



Red Head Spark Plug Wrenches are produced by the Emil Grossman Company, New York City, maker of the Red Head plugs.


Red Head Plug Wrenches

The wrenches come in sets of two and by their use danger of breaking the porcelain is avoided. In disassembling a plug with an ordinary wrench the insulating member is easily cracked, especially when removing or tightening the bushing. With the Red Head wrenches, one is utilized to hold the shell and another fits the bushing. These devices are furnished with a set of four plugs or may be secured for a small sum and are adaptable to standard types of spark plugs.

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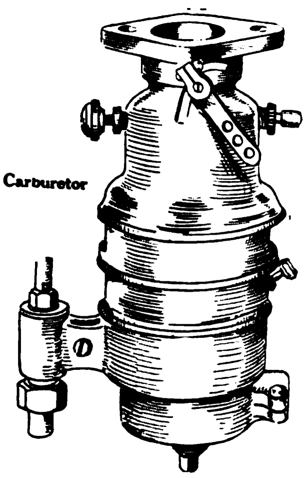
The Scott Carburetor, manufactured by the Scott & Sons Company, Medford, Mass., is a double needle vaporizer in which the auxiliary air valve is not actuated by a spring, and it is claimed by the maker that it supplies a correct mixture at substantially the same stress at all speeds and automatically adjusts itself to altitude. These qualities are obtained by the action of the auxiliary air valve which controls the high speed needle member, differing from those of ordinary form inasmuch as it is slabbed tapering on three sides, producing a like number of fine sprays and facilitating vaporization of the fuel. The valve moves in accordance with the speed of the piston, that is to say, it moves downward as the speed increases, and as the taper on the needle is inverted the flow of fuel is increased and vice versa. A feature is the fitting of a starting valve which may be operated from the radiator or dash. An air adjustment for high speed is incorporated over the auxiliary member and a low and high speed adjustment for the fuel. The only spring utilized is that in conjunction with the high speed needle and it is claimed that its operation is such that it is not impaired by long service. The maker emphasizes the fact that the carburetor is adjusted easily and that when once set requires no further attention.


Scott Carburetor

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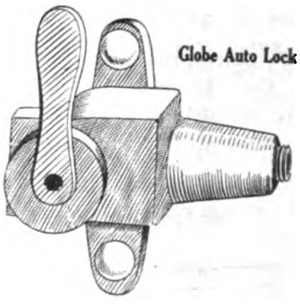
Caldwell's Gas Tubing will appeal to motorists who have experienced trouble with acetylene lamps due to leaky piping. The ordinary rubber tubing is short lived as the weather affects the material and it becomes hard and cracks easily, thus causing a loss of gas. Sometimes the apertures are minute and the escape of acetylene is not noticeable. This loss is augmented when the burners are clogged as the pressure is increased at the tank to obtain the desired flame. While water does not affect rubber, the oxygen in the air in time hardens the compound which loses its life or elasticity. The Caldwell tubing consists of a heavy and high grade material, which is covered with braid by a special process, this being closely woven yet not diminishing the flexible qualities of the piping. This covering protects the rubber from the air, thereby keeping it soft and considerably lengthening its life. It is pointed out by the maker that the material will endure as long as the braid is intact and that the latter is very durable. Being sturdily constructed it is not affected by the vibration of the automobile and the dark colors of the braiding harmonize with that of the machine and add to its appearance. The tubing is produced by the Caldwell Manufacturing Company, 1756 Cranston street, Providence, R. I., and is comparatively inexpensive.

Caldwell Gas Tubing

The Globe Auto Lock will appeal to motorists, inasmuch as use or theft of the automobile is prevented. It is a simple, compact attachment in the form of a valve and provision is made for inserting in the fuel line. It may be fitted to the outside of the car body, under the front seat or any other convenient place, and when the lever is moved it shuts off the supply of fuel positively and locks the device. The loss of gasoline by flooding or leaking of the carburetor is avoided and in the event of the vaporizer catching fire the main supply is quickly shut off. When the valve is locked, the machine can only be operated for a very short distance, this depending upon the amount of fuel in the carburetor. The device is manufactured by the Globe Auto Lock Company, Canisteo, N. Y.


Globe Auto Lock

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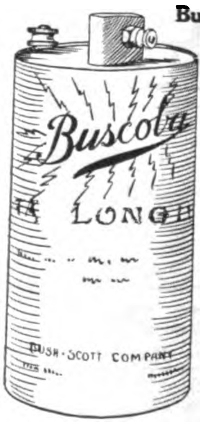
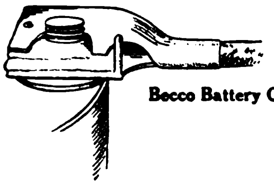
The Buscoba Dry Cell is marketed by the Bush-Scott Company, Detroit, and is made to meet the demands of those desiring a high grade special dry battery, applicable for internal combustion engines and all electrical purposes. It is of the usual form, being round, and is equipped with screw terminals. The maker claims extra long life and recuperative powers. The cell is covered with a yellow wrapper to distinguish it from other makes.



Buscoba Battery

The Becco Battery Connector, manufactured by the Beck Company, Rockville Centre, N. Y., is an improvement over the ordinary form inasmuch as the construction of the device is such that it is claimed it cannot jar loose when properly attached. It is made in the form of a clip, two members being pivotally mounted and provided with a recess to fit the terminal of a battery. When placed over a binding post and the clips snapped together, it is stated that the use of a screw driver or similar tool is necessary to release the members. The device is made of heavy drawn brass, and is neat and inexpensive.


Becco Battery Connector

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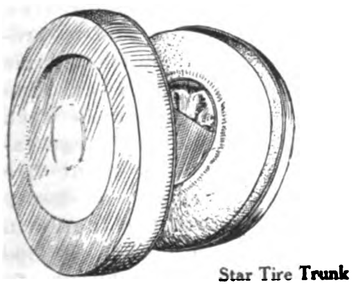
Star Tire Trunks will appeal to motorists of discriminating tastes as they are constructed in the form of a shoe and are very neat in appearance. They are made of pressed steel with a polished finish, and are light, strong, durable, clean and noiseless. A compartment is provided for the storing of inner tubes, and the trunks are thief and water proof. A feature is their accessibility. They are marketed by W. W. Winship, Boston.


Star Tire Trunk

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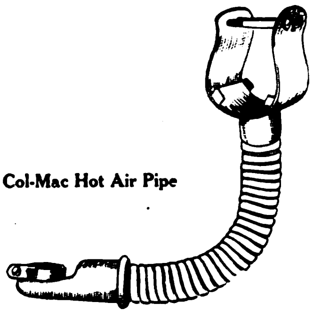
The Col-Mac Hot Air Pipe is a device for facilitating the vaporization of the fuel at the spraying nozzle. It consists of a metal bound flexible tubing in one end of which is a member so constructed that it fits over the air intake of the carburetor and is held in place by an adjustable ring and lock screw and nut. The other extremity is U shaped and is placed over the exhaust pipe where it is secured by means of two machine screws. By this arrangement heated air is taken from the exhaust pipe and drawn in through the tube to the carburetor, past the spraying nozzle. The hot, dry air not only effects a saving of gasoline but eliminates choking, condensation and freezing. It is claimed that sluggish motors will pick up quickly with the device and that climatic changes do not affect the action of the carburetor. Where a machine is not fitted with a pan or undershield it will prevent water and foreign elements being drawn into the vaporizer, thereby avoiding trouble from this source. The device is inexpensive and is applicable to any motor. It is manufactured by the Breeze Carburetor Company, Newark, N. J.


Col-Mac Hot Air Pipe

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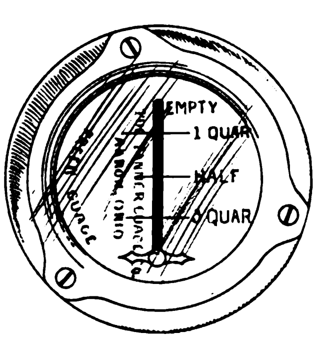
The Freer Liquid Gauge is designed to overcome carburetor troubles caused by the use of improper measuring devices, such as dirty sticks, etc. It consists of a reading dial fitted with heavy plate glass and calibrated to indicate the amount of fuel in the tank. An indicator moves freely over the face of the dial and is actuated by a float in the container, the float rising and falling, thus moving a rod connected with the registering member. It is adaptable to any type of fuel tank either gravity or pressure feed, and the glass member permits of noting the amount of fluid in addition to the indicator. It is produced by the Tanner Gage Company, Akron, O.



Freer Liquid Gauge

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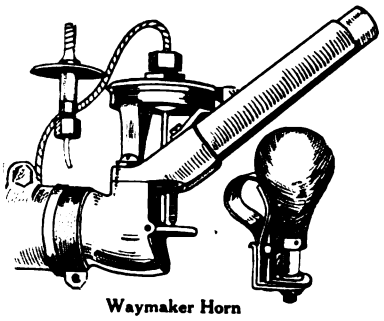
The Waymaker Horn is a new type brought out recently by the Lee Tire & Rubber Company, Conshohocken, Penn., and differs from the usual exhaust actuated members inasmuch as it is operated by a miniature rubber bulb located on the steering wheel or in any convenient place. Connecting the bulb and device controlling the exhaust gases is a flexible tubing wound with metal for protection. When the bulb is pressed a valve-like device allows the gases to flow into the horn, the amount depending upon the pressure exerted on the bulb. The signal is attached to the end of the exhaust pipe leading from the muffler and is easily and quickly fitted. The Waymaker horn is also made with foot control.


Waymaker Horn

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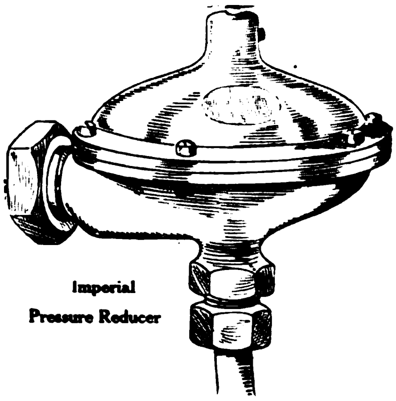
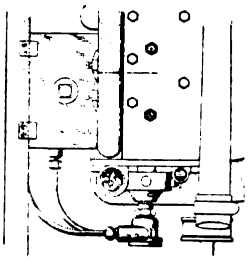
The Imperial Pressure Reducer is designed to reduce properly the pressure and to regulate automatically the flow of acetylene from tanks, the pressure of which may vary. It is a neat, compact device, attached to the usual connection of the tank and is so constructed that the pressure is reduced from 300 pounds to as low as two ounces. It delivers a steady, even flow of gas whether the container be empty or fully charged. It will appeal to motorists contemplating the fitting of an acetylene self-starting device as with the reducer the desired and necessary pressure may be obtained. It is made by the Imperial Brass Manufacturing Company, Chicago.


Imperial Pressure Reducer

The Pedersen Oiling System for model T Ford cars is manufactured by the Pedersen Lubricator Company, New York City, and is similar in operation to the oil pumps made by this concern. It consists of an oil tank, pump, tubing and an adjustable sight feed indicator. The pump is attached to the timer shaft by a nut, this operation requiring the fitting of a new commutator cover which is a part of the equipment. The oil container is secured to the frame or any other convenient place near the motor and a pipe leads from the vessel to the pump and another to the indicator on the dash. Still another tube carries the lubricant from the sight feed member to a pet cock in the crankcase. When the motor is operating the pump draws lubricant from the tank and forces it to the dash device, equipped with an adjusting screw by means of which the amount of oil fed to the crankcase may be regulated to a nicety. As the speed of the engine increases the amount of oil pumped is in proportion and it is claimed that smoking is eliminated, as well as the necessity for refilling the crankcase. The pipes are cut to length and provided with connections ready to screw together and are attached easily.



Pedersen Oiling Pump

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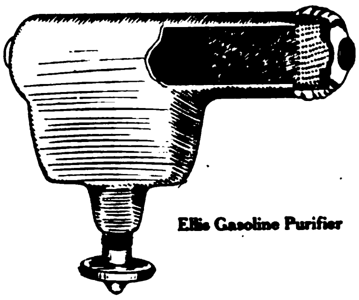
Worden's Auto Pliers, produced by E. M. Worden, Ladysmith, Wis., is a combination tool which will appeal to motorists and repairmen, it being stated by the maker that it represents 15 tools in one. Among the important offices which they fill are a pipe wrench, wire cutter, screw driver, nail puller, belt puncher, cotter pin tool, etc. They are constructed of a high grade of material, nickel plated and guaranteed by the maker.

The Ellis Gasoline Purifier differs from a fuel filter inasmuch as the device not only separates water from the fuel, but kerosene and dirt. It is a compact device, weighing about six ounces and is inserted in the fuel line between the supply tank and carburetor. The gasoline first enters the precipitation chamber and is filtered through two fine screens, two felts and quartz. Any water in the gasoline will lodge in the precipitation space while the fuel, being lighter, will rise and flow to the vaporizer. The device is equipped with a knurled thumb screw by means of which accumulations of water, dirt, etc., may be drained easily and quickly. It is made of an aluminum composition and comes complete for attachment. The L. P. Rhines Company, Boston, is special agent.



Ellis Gasoline Purifier

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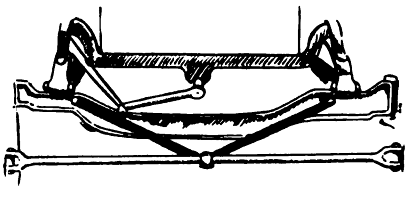
The Little Steersman is a spring device designed for attachment to the tierod and axle so that in the event of an accident to the steering gear or the breaking of any of its components, the front wheels are kept in alignment. It consists of a helical spring, constructed of oil tempered steel wire, with attachments for the end and centre. The latter are drop forgings. It is claimed that the Little Steersman makes driving easy, and takes up automatically lost motion between the steering gear and wheels. It is nickel plated and does not detract from the appearance of the machine. It is produced by the Modern Auto Appliance Company, Chatham, N. Y.



Little Steersman

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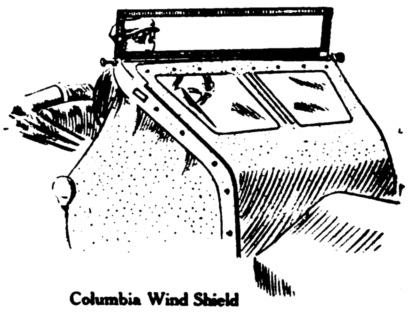
The Columbia Windshield is custom made by the Columbia Top & Tire Company, Boston, and is constructed both for the protection of the passengers in the front seats and the tonneau. When fitted to the latter it may be utilized as a light service table by folding back the upper part. It is made of flexible leather covering a light brass frame, steel lined, and the use of glass is avoided. Several adjustments as to positions are provided and it is claimed that the wind is deflected in such a manner that it does not strike the occupants of the rear seat.



Columbia Wind Shield

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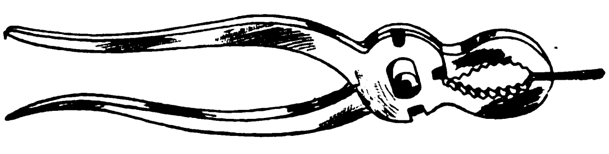
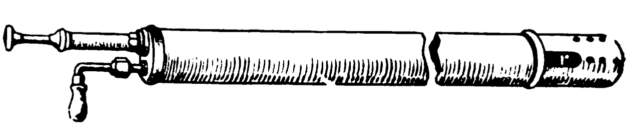
The Turner Hot Blast Tubular Gasoline Torch is a new product of the Turner Brass Works, Sycamore, Ill., and is said to produce an intensely hot blast flame easily controlled by a gasoline valve. Its construction is such that it is adaptable to a large variety of work. It is about five feet long, constructed of heavy gauge brass tubing, two inches in diameter, with a burner at one end and a pressure pump at the other. The long tube is utilized to contain the supply of fuel and holds about three quarts. A unique feature of the appliance is the controlling valve inside the tube which regulates the flow of the gasoline in such manner that the torch may be used in any position. A pump supplies air pressure in the fuel chamber. The size of the flame at the burner is 12 inches long and two in diameter. The torch weighs about 16 pounds and it is claimed that a quart of fuel will last an hour.

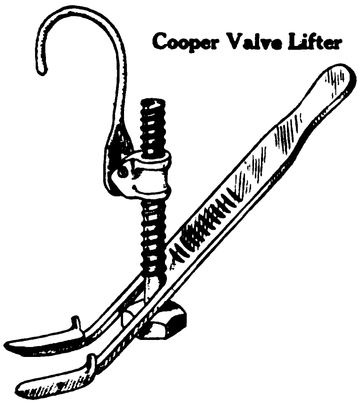


Worden's Auto Pliers



Gasoline Torch

The Cooper Valve Lifter is the invention of John J. Cooper, Providence, R. I., and differs from the usual tool of this nature in that means are incorporated whereby the instrument may be locked securely after the valve spring of a poppet valve has been compressed, enabling the operator to use both hands in removing the cotter key or retaining members. The device consists of a U shaped member, one end of which bears upon the valve proper while the other extremity is fitted with a movable threaded screw rod. The lower end of the latter is recessed to take a lever slotted at one end and having a bearing upon an enlarged portion. The forked part of the lever is slightly upturned and is equipped with two tilting shoes pivotally mounted which are designed to be self-levelling and to bear evenly against the retaining member of the valve spring when the latter is compressed. The inner edges of the movable shoes are adapted to engage the rim of the collar of spring to prevent the lever from moving too far forward. The upper surface of the lever is fitted with deep notches for the purpose of engaging and retaining a brace member which is interposed between the serrations and threaded screw or nut. The length of the screw is such that the valve lifter may be utilized on any sized engine by changing its adjustment, which may be accomplished easily with the tool in position.


Cooper Valve Lifter

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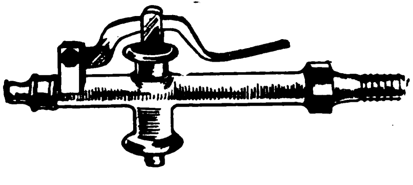
The Waste Not Water Nozzle has been brought out by A. W. Gamage, Ltd., London, England, to prevent an excessive waste of water when washing the motor car or other vehicles. It is fitted to the end of the usual hose and in place of the regular nozzle is provided with a hand cock and lever. Normally the water is shut off and to obtain use of the fluid the lever must be depressed. When released it automatically shuts off the supply. It is claimed that the initial cost of the device is saved in water bills in a short time as chauffeurs are prone to allow the fluid to run while performing other work in connection with the cleaning of the machine.


Gamage Water Nozzle

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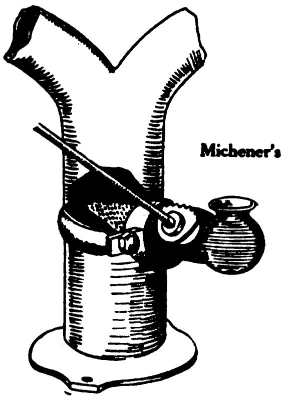
Michener's Gas Saver and Primer, made and marketed by E. S. Michener, New Castle, Penn., is a device for attachment to the intake pipe or manifold by means of a brass strap and lock nuts. It is hand controlled, and is fitted above the carburetor and operated from the dash by an adjustable rod. A wire gauze cone is incorporated, this being for the purpose of breaking up the fuel and for aiding in vaporization. The hand actuated valve permits of an opening ranging from zero to .5625 inch, admitting auxiliary air, and it is claimed that an economy of gasoline is effected thereby. A priming cup is incorporated for the purpose of facilitating starting in cold weather. The device is made of solid brass, highly polished, is installed easily and is not expensive.


Michener's Primer

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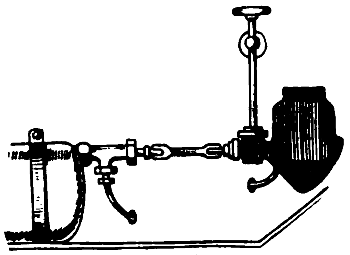
The Grinnell Gas Controller and Igniter is produced by the G. C. A. Manufacturing Company, Pittsfield, Mass. As the name implies it is designed to regulate the flow of gas from the tank to the burners, and to light the latter from the seat by the turning of a small handle which is a part of the device. It includes the spark generating instrument and is neat and compact and attached easily to the frame of the car. Connecting the controlling mechanism and tank is a universally jointed rod which is provided with adjusting means so that in the event the pressure of the acetylene becomes reduced the proper flow to the burners may be secured. The lamps may be lighted and extinguished by a simple turn of the wrist, or dimmed as desired. The controller does not interfere with the operation of ignition system of the machine, being entirely separate, and the gas tank may be renewed in the usual manner. The burners are constructed to withstand hard usage and the spark points are held by brass springs, facilitating the removal and replacement of burners.

Grinnell Gas-Controller



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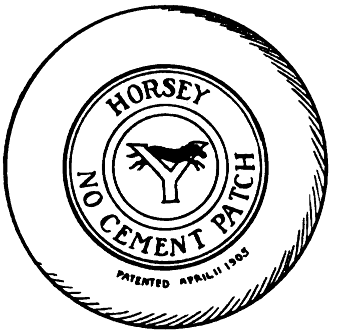
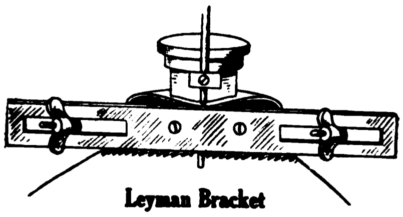
The Horsey No-Cement Patch, as the name implies, does not require the use of cements or acids in its application, the process involving but the usual cleaning of the tube, moistening the patch with gasoline and then affixing. The patch is manufactured of an elastic, open steam cured, red rubber and is made thick in the centre and tapering to its edges. To the cured part a layer of uncured material is permanently attached by a special process. It is claimed by the maker that a permanent repair may be effected because of its non-blooming qualities. It is produced by the Horsey Manufacturing Company, Cleveland, O.



Horsev Patch

The Leyman Bracket, produced by the Leyman Company, Cincinnati, O., is a combination license plate and pennant holder. It is designed to fit over the radiator and is secured by a binding screw which allows of adjustment to any height. The license tag is held securely and away from the radiator, and it is claimed that the plate will not rattle or vibrate. Provision is made for the attachment of pennants, the staff being held by a set screw. The bracket is made of solid brass, highly finished; is fastened by means of wing nuts, and will fit any radiator having a filler member.


Leyman Bracket

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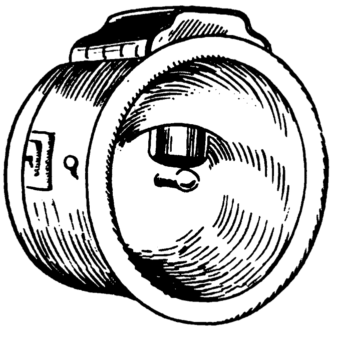
The Butylight headlights are self-contained; that is, they burn denatured alcohol under pressure and it is stated that a very high degree of brilliancy is obtained. This is brought about by the use of a mantle which is said to be impervious to vibration or road shocks. The fuel is utilized in a somewhat similar manner to the gasoline in a torch and the flame may be regulated as desired. It is pointed out by the maker that owing to the pressure in the container the last drop of alcohol will be converted into a useful product. The lamp is equipped with a pressure gauge and a valve, and it is claimed that it will operate efficiently at five pounds. Pressure is brought about by the use of an ordinary tire pump. The lamp is similar in appearance to acetylene members and fitted with a reflector which is cleaned easily. It is stated that a pair of lamps may be operated at a cost of one cent an hour. Benjamin N. Levy and William T. Fox, 32 Union square, East, New York City, are agents.


Butylite Headlight

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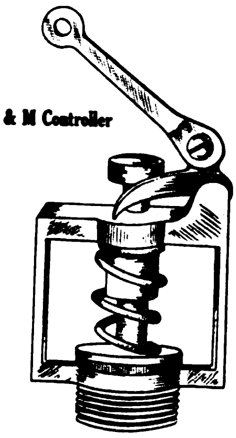
The M & M Controller and Economizer is manufactured by the Moller Bros. Controller & Economizer Company, Betz building, Philadelphia. It is designed to be inserted in the intake manifold of an internal combustion engine, the operation involving the drilling and tapping of a hole. It comprises a frame carrying a valve member which is held securely on its seat by a spring. The valve stem is fitted with a head which is in contact with a cam member pivotally mounted on the lifting lever which is actuated by a pedal convenient to the operator. When the valve is lifted the suction created by the piston of the engine draws in fresh air instead of mixture, and it is claimed by the maker that no gasoline whatsoever is drawn from the carburetor. One of the features emphasized in the device is that it may be utilized to retard the progress of the car by utilizing the compression stroke of the motor, and that as the ignition is cut off the cylinders draw in fresh charges of atmosphere thereby cooling the engine, as well as eliminating any possibility of back firing in the vaporizer. The M & M controller is equipped with a switch like device which automatically interrupts the primary circuit when the lever is lifted and by this arrangement it is claimed that rough roads may be traversed more easily, and that fuel may be saved as well. The device is compact, being about two by 3.5 inches, is inexpensive and is installed easily.


M & M Controller

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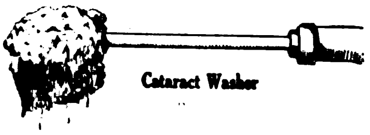
The Cataract Washer, manufactured by the Cataract Auto-Vehicle Washer Company, Topeka, Kan., is designed for washing vehicles, and it is claimed by the maker that it will outlast five sponges. It consists of a metal handle for attaching to the water line and the other end of the tool is threaded to take the washing member. The latter is of best quality mop yarn and is wound about the corrugated brass head, being held securely. The water flows through the handle and finds its way through the perforations and then through the yarn. The washer is made in two styles, one having a long handle which keeps the hands out of the water and is designed for winter use. The other form permits the hand to grasp the mop for operation as with a sponge. It is stated by the maker that as the water is flowing during the washing all dirt and grit are removed easily without injuring the finish of the car. The Hagstrom Bros. Manufacturing Company, Lindsborg, Kan., is exclusive selling agent.


Cataract Washer

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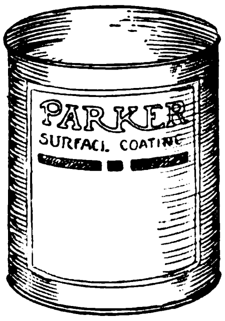
Parker's Surface Coating is a paint held to be acid and alkali proof, being produced in several colors which the maker, the Parker Refining Company, Cleveland, O., states will not fade. The cement coating is made especially for brick, stone or concrete buildings and it is pointed out that these materials are porous and absorb and hold considerable dampness. It fills and seals these pores, keeping the cement or concrete dry, clean and sanitary. It is especially adapted for garage floors and when applied produces an elastic, tough surface, making for easy cleaning and eliminating dampness.

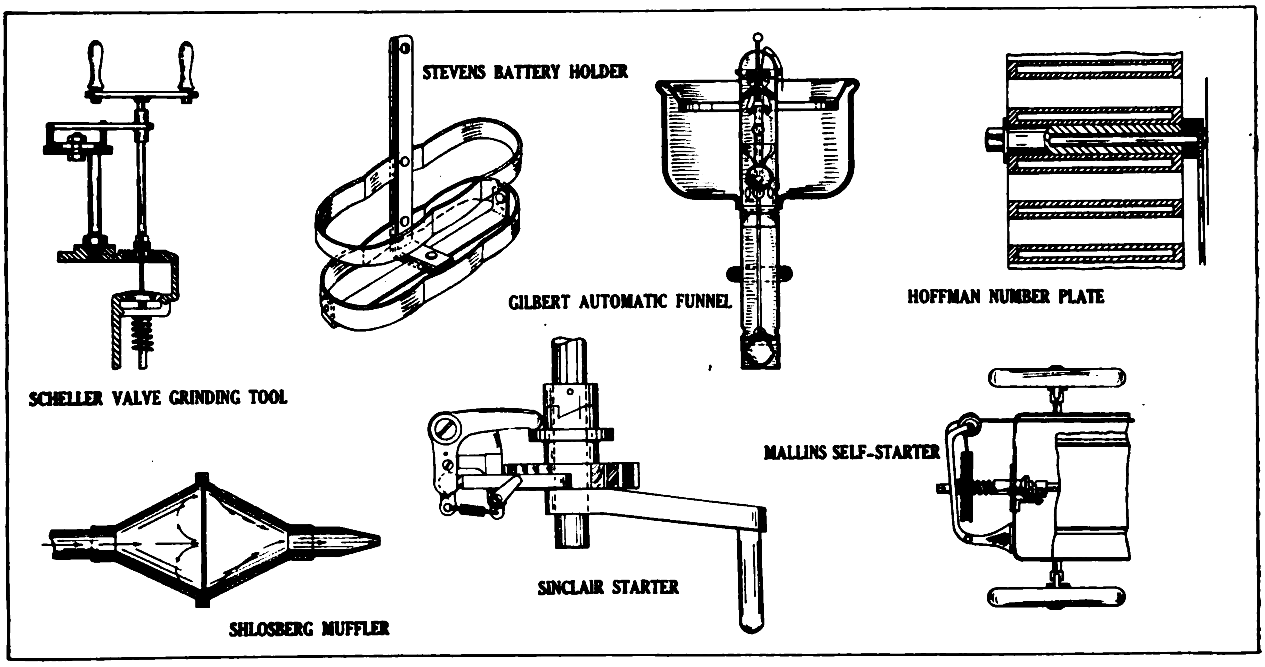


Parker Surface Coating

RECENT PATENTS of INTEREST

Scheller Valve Grinding Tool.

The valve grinding tool which may be rigidly attached to the motor during the work, and which is adjustable to any type of engine, has been patented by John Scheller, Milwaukee, Wis. It comprises a post member which is screwed into the opening of the cylinder utilized for the spark plug, and locked by a nut. The top of the post carries a horizontal arm on which is fitted a slidable extension and provision is made for locking the parts securely. The adjustable extension is hinged, and is equipped with a vertical member which serves as a guide for the vertical rod carrying the valve turning bit. The upper part of the rod is fitted with horizontal extensions which carry handles for the purpose of rotating the tool in either direction. During the process of grinding in the valve, the latter may be lifted from its seat by means of the hinged member.



Some Recent Patents of Interest to the Manufacturer, Agent and Owner, Including Safety Starting Crank, Valve Grinding Tool, Self-Starter, Dry Cell Holder, Number Plate Holder, Automatic Funnel, Etc.

Gilbert Automatic Funnel.

A patent has been granted Fred E. Gilbert, Jacksonville, Fla., for an automatic funnel having a valve mechanism whereby the flow of liquid either up or down may be controlled as desired by the operator. It is similar to the ordinary funnel except the upper portion is bowl shaped and the tube carries three valves having seats. The lower valve is fitted with a float, its function being to close the tube preventing an overflow of the funnel. Another valve controls the ports through which the liquid flows while the third member is provided with locking mechanism, preventing the movement of liquid in either direction.

Stevens Battery Holder.

The utilization of dry cells in the motor car requires caution in installing else the efficiency of the members is apt to be impaired through short circuits. The usual practise is to employ waste or paper to secure the batteries and to prevent the terminals from coming in contact with one another. Herbert A. Stevens, Malden, Mass., has been granted a patent for a battery holder which permits the installation or removal of the cells as a unit and it is claimed that the device will hold the members securely. It comprises a series of belts or band members attached to a vertical support and the low band is equipped with cross sections which serve as retainers for the cells. These bands conform to the shape of the batteries and when the latter are in position it is stated that they will not jar out of their relative positions.

Shlosberg Muffler.

Maris Shlosberg, Chicago, has patented a muffler which varies from those of usual construction in that it is cone shaped. It consists of a pair of hollow cones secured together at their bases and separated by a divisional plate having slight communicating openings between the cones located near its periphery. One of the cones is connected to the exhaust pipe while the other is equipped with a tube having an opening considerably smaller in diameter than that of the pipe. The exhaust gases from the motor enter the first cone, encounter the divisional plate, and are deflected through the openings into the second chamber, thence out into the open air. The inventor claims that back pressure is eliminated and that the noise of the explosions is reduced to a minimum.

Hoffman Number Plate.

One of the objections to attaching number plates to the front of the radiator is that the efficiency of the cooler is reduced thereby, also that the supporting members are likely to chafe the thin metal of the fins causing leaks. Peter M. Hoffman, Chicago, has been granted a patent for a number plate designed for attachment to the radiator, which he claims overcomes these difficulties. The plate is perforated, said openings corresponding to those of the cooler, and the extensions of the plate are provided with means for holding the member securely and thus eliminate chafing.

Sinclair Safety Crank.

The introduction of the self-starter for internal combustion engines has stimulated the efforts of inventors along the lines of safety devices for attachment to the starting crank so that in the event of a backfire the operator will not be injured. George B. Sinclair, Medford, Mass., has been granted a patent for a device which, it is claimed, will automatically release the clutching member of the starting crank when the latter is rotated other than in the normal direction of the motor. The extension of the crankshaft of the motor carries an integral clutch member which engages with a similar part slidably mounted, and attached to this is the starting handle. The moving member has a shoulder which engages with a bell crank pivotally mounted, and is actuated by a pawl in engagement with a ratchet wheel integral with the sliding clutch. A spring holds the pawl in contact, the latter permitting the ratchet to rotate in one direction but if the latter be reversed as by a backfire, the pawl member imparts motion to the bell crank, which being in contact with the shoulder in the sliding clutch automatically disengages the latter.

Mallins Self-Starter.

Although the self-starter is not taken as seriously in England as in this country it is interesting to note that an American patent has been granted Charles William Mallins of Liverpool, England, for a device for starting internal combustion motors from the seat of the car. It is unique in its construction, inasmuch as it is operated by pulleys and a cable. The latter, which is equipped with a shovel shaped handle on the dash, extends therefrom to the front of the motor passing over a pulley fitted to a pivotally mounted arm. The latter carries a larger pulley on which the operating cable is coiled, and is attached to an axially movable shaft provided with a coupling for engagement with the end of the crankshaft of the motor. The large pulley is equipped with a spring, the function of which is to coil up the cable, after the latter is unwound by operation. Means are provided for disengaging the clutch coupling from that of the engine shaft if the rotation of the latter be reversed. In practise the handle is grasped by the operator and when pulled brings the movable arm and clutch into engagement with the crankshaft. A further movement of the cable rotates the larger pulley which in turn imparts motion to the crankshaft of the engine. Upon releasing the handle the spring rewinds the cable. It is claimed by the inventor that the device is operated easily and that it may be attached without any great alteration to the car.

OTHER PATENTS GONE TO ISSUE.

Tank Bracket and Step, Russell Huff, Detroit. A combination of step and bracket for holding an acetylene gas tank.

Spring, William R. Park, Taunton, Mass. A vehicle spring composed of resilient leaves in sliding contact with each other and having a film of wax between adjacent leaves.

Windshield, Chicago Coach & Carriage Company, Chicago, Ill. A windshield in which both upper and lower parts may be moved into various positions, each part independently of the other.

Solid Tire, Alexander Dow, New York City. A solid rubber tire containing several separated layers of fabric, each layer being formed into undulations whose crests extend diagonally of the tire, and with the weave of the fabric extending diagonally of the piece.

Self-Starter, Louis T. Weiss, Jr., New York City. A starter using acetylene gas under pressure, a handle on the dash operating tank valve and individual cylinder valves.

Motor, James C. Peache, Rugby, England. A two-cycle engine with a single sleeve bearing the inlet and exhaust ports at opposite ends.

Clutch and Starter, E. U. G. Reagan, San Antonio, Tex. A combination of clutch and starter, in which a spring is used to turn over the motor, being wound by the latter when running.

Tire, A. William Torkington, Purley, England. A solid tire in two circular halves, held by a band bearing cross arms bolted to plates at the side of the tire.

Lamp, William K. Lenhart, Philadelphia. An acetylene lamp containing one central fixed burner and two adjustable burners, one on each side of the central burner.

Spark Plug, William Ellis, Harrod, O. Has a number of electrodes in two sets with two terminals.

License Tag Holder, John W. Yochem, Tiffin, O. Plate is held top and bottom in channels, the lower part of the device being adjustable to take different size plates.

Motor Fire Apparatus, Harry W. Eisenbise, Reading, Penn. Combination chemical and water pump, the chemical tank valves being three-way allowing chemical to be directed to chemical hose line or mixed with water in the water hose.

Pneumatic Wheel, W. W. Guest, Alameda, Cal. The tread of this is in sections, each section being connected to a piston working in a cylinder containing air. Each cylinder is connected to a compression chamber except when the piston moves inward under the weight of the vehicle.

Lamp, R. G. Harris, Knoxville, Tenn. A lamp containing three reflecting partitions whereby rays of light from one source are directed through bull's-eyes to the right, left and below.

Muffler, Joseph Hall, Manchester, England. The first baffle plate has a dome shaped head which deflects the gases to perforations in the flat portion. The course of the gases is changed three times before they exit.

Electric Horn, Adam Lungen, assignor to Edwards & Co., New York City. A diaphragm is struck by a spring vibrated by an electro magnet, similar to the manner of the vibrator of a coil.

Electric Lighting and Starting System, Charles E. Bonine, Philadelphia. Consists of a shunt and series wound motor-generator, and storage battery with aumatic switch.

Tire, S. T. Allen, assignor to Triplex Tire Company, Detroit, Mich. The felloe is surrounded by a resilient band around which are arranged interlocking T shaped members, reinforced by metal pieces and held by a flange.

Rotary Engine, Jules F. Bourlon, Everett, Mass. Cylinder is annular with a continuous slot in its inner periphery. The pistons are provided with flanges overlying the slot and explosion chambers are formed by movable abutments.

Pipe Wrench, H. R. Sinclair and Carl Ekman, Worcester, Mass. The gripping member of this is a strap held in a wedge shaped passage on the handle by means of a wedge.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

WHAT PITCH AND DIAMETER MEAN.

Despite the great amount of technical knowledge which has been disseminated by the rapid development of the automobile, and the corresponding spread of information pertaining to the complete machine and its parts, there are still a number of terms in common use which are not understood by everyone. Owners, operators and others do not know exactly what is meant by the terms "pitch," "pitch diameter," and the variety of names of dimensions and parts of gears and sprockets.

Very recently, in fact, within a few weeks, The Accessory and Garage Journal has received several queries relative to gears and gear parts. In answer to these inquiries, a short and simple explanation of these everyday matters will be attempted.

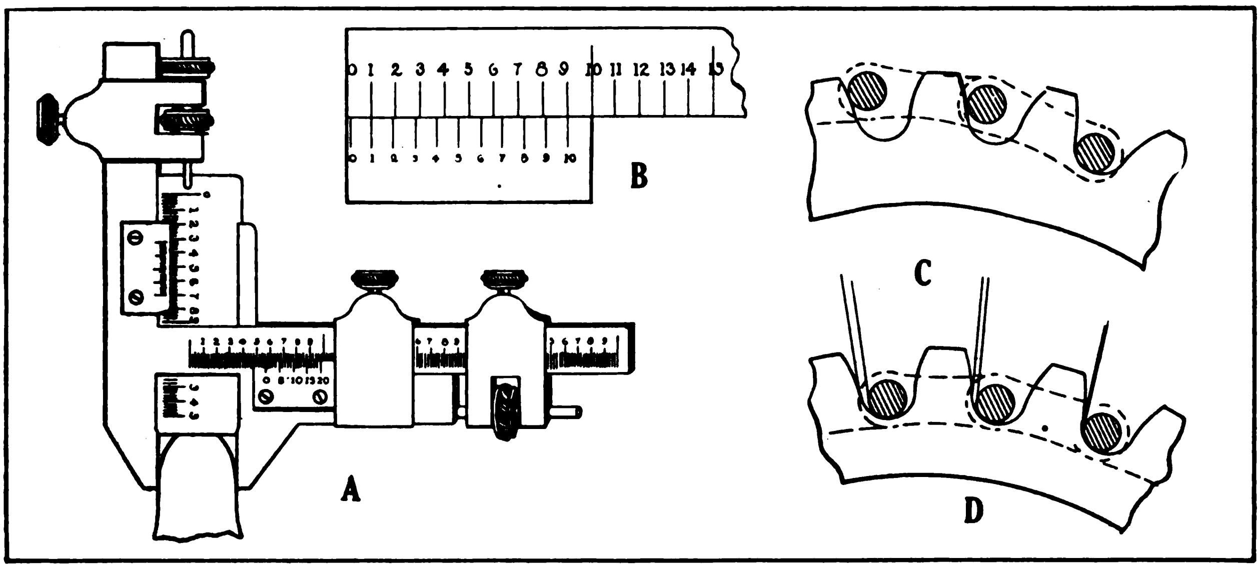


Fig. 1—Circular and Diametral Pitch of Chains: A, Micrometer Tooth Measuring Instrument; B, Vernier for Reading Fine Divisions; C, Worn and Stretched Chain Climbing Sprocket; D, Clearance Between Rollers and and Teeth with New Chain.

To begin with, the pitch line is a theoretical line drawn through the teeth of a gear or sprocket and this line is the perimeter of a circle having the same centre as the gear and concentric with it. When two gears mesh the teeth contact on this pitch line, which is about the centre, measuring from the top to bottom of the tooth. If a straight line be drawn from the centre of one gear to the centre of the other the pitch lines will be tangent to each other at the point they are intersected by this line.

The diameter of the circle formed by this pitch line is called the pitch diameter, and when reference is made to the diameter of a gear or sprocket this is always understood to be the one. There are also two others used in calculating gears; the outside and root (or bottom of the tooth) diameters.

Circular and Diametral Pitch.

The distance from the centre of one tooth to the centre of the next, measured along the pitch circle, is called the circular pitch and is obtained by dividing the circumference of the pitch circle by the number of teeth on the gear or sprocket. In gear construction it is essential to work with the diameter of the gears, a pitch being used that is expressed in terms of the diameter and this is called diametral pitch. It is not a measurement of distance but a ratio and consists of the number of teeth on the circumference of the gear for each inch diameter, and is found by dividing one by the other. For illustration: If a gear has 80 teeth and the diameter is 10 inches, 80 divided by 10 which gives eight, is the diametral pitch of the gear.

Roller chain dimensions include pitch, diameter of roller and inside width. In defining the pitch of a chain or sprocket, the circular pitch is used, this being the same as pitch of the sprocket. When a chain is placed on a sprocket the pitch line passes through the entre of the rollers and the pitch is the distance from the centre of one to that of the next.

Making Gears and Sprockets.

In the manufacture of spur gears or sprockets a blank is first turned in a lathe and then transferred to a milling machine to cut the teeth, a process requiring accuracy as well as care in the case hardening which follows. Gears are designed to have a small amount of clearance, or backlash, at their pitch line; that is, the space between the teeth at the pitch line is slightly in excess of the thickness of the teeth at that line.

This difference is but a few thousandths of an inch and a variation either by improper meshing or alignment results in excessive wear and noise. A micrometer tooth measuring device utilized for this purpose of estimating accurately the distance from top to pitch line, and thickness of teeth at pitch line, is shown in accompanying sketch, Fig 1, at A. The tongue moved at right angles to the jaws is set to the depth the pitch line should be from the top of the tooth, and the thickness of the tooth is measured by the sliding jaw. By using a vernier, which is shown at B, measurements are obtainable in thousandths.

Proper Meshing of Teeth.

The distance between the teeth at the pitch line on a sprocket is influenced by the rollers as the centre line of the roller must agree with the pitch line of the sprocket. Although gears of the same pitch will mesh, in fitting chains to sprockets the pitch line and roller diameter must be similar. Sprockets are constructed so that the rollers will enter and leave without friction, and seat. Provision is made for wear of the chain, otherwise it would climb and ride the teeth of the sprocket. Allowance is also made for stretching of the chain.

At D is shown a sprocket which is driving the chain to the right and the amount of clearance is designated by vertical lines. The roller at extreme right is leaving the tooth and the middle roller is gradually coming in contact with its tooth. The drive is being effected by one tooth, but as the chain stretches and wears, other teeth will participate in the driving. At C is shown a chain that is worn and consequently stretched. It will be noted that one roller is climbing the tooth and further wear usually results in the chain riding the sprocket and causing trouble.

Measuring Chain Sprockets.

Wear of chains is caused largely by the dust that is attracted by the oil or grease with which they are lubricated. This also applies to the teeth of the sprocket which wear is denoted by indentations of a hook-like appearance. Additional wear can be secured by reversing the sprockets, but a new chain will be necessary. If a new chain be needed the pitch may be ascertained by measuring from centre to centre of the rivets.

Another method is to make a tracing of the sprocket on paper, but it is not necessary to remove the sprocket on some types of cars. A template can be made by holding a sheet of stiff paper against the sprocket and the pattern can be cut by tapping with the ball end of a pein hammer. A hole should be cut in the centre of paper so that it will pass over the hub of the sprocket.

From the centre of the pattern scribe three circles; one around the outside through the points of the teeth, another through the root or bottom of the teeth, and the third between the first two, which will be the pitch line. With a pair of calipers measure from the front or unworn side of a tooth at the point where it is cut by the pitch line, to a similar point on the adjoining tooth. After calipering several and finding the distance is approximately the same, it may be taken as the pitch. The pitch of chains is measured by eighths up to one inch, and by quarters above that. The diameter of the rollers is equal to the height of the tooth or the distance between the root and outside circle. The inside width is the length the roller must be to allow side links to clear teeth.

Usual Clearance on Roller Chain Sprockets.

Pitch in inches	Clearance in inches	Pitch in inches	Clearance in inches
.50	.03125	1.50	.15625
.75	.06250	1.75	.18750
1.00	.09375	2.00	.21875
1.35	.12500		

Description of Vernier.

Reference has been made to a vernier, which is a device for reading finer divisions on a scale than those by which the scale is divided. One-sixty-fourth inch is about the finest division that can be read accurately by the naked eye. When fine work is necessary, the vernier is employed.

One division on the vernier is equal to .9 of one division on the true scale, consequently the difference equals .1 of the true division or when each of these is one inch, .1 inch. The difference at the second division is .02, at the third .03, and so on. If the vernier be moved until the third division coincide, it will have moved .03 inch. It is this principle that is applied to measuring instruments.

When graduated to read in thousandths, the true scale is divided into 50 parts to the inch and the vernier is graduated into 20 parts, each division on the vernier being equal to nineteen-twentieths of one on the true scale. If the vernier be moved so that the lines at the first division coincide, it will have moved one-twentieth of one-fiftieth, or .001 inch.

The following tables give the figures for converting diametral pitch to circular pitch and the latter to diametral pitch for all sizes from one inch up:

Table No. 1.

Diametral pitch, inches	Circular pitch, inches	Diametral pitch, inches	Circular pitch, inches
1.25	2.5133	11.00	0.286
1.50	2.0944	12.00	0.262
1.75	1.7952	14.00	0.224
2.00	1.571	16.00	0.196
2.25	1.396	18.00	0.175
2.50	1.257	20.00	0.157
2.75	1.142	22.00	0.143
3.00	1.047	24.00	0.131
3.50	0.898	26.00	0.121
4.00	0.785	28.00	0.112
5.00	0.628	30.00	0.105
6.00	0.524	32.00	0.098
7.00	0.449	36.00	0.087
8.00	0.393	40.00	0.079
9.00	0.349	48.00	0.065
10.00	0.314		

Table No. 2.

Circular pitch, inches	Diametral pitch, inches	Circular inches pitch,	Diametral inches pitch,
2.0000	1.571	0.8750	3.590
1.8750	1.676	0.8125	3.867
1.7500	1.795	0.7500	4.189
1.6250	1.933	0.6875	4.570
1.5000	2.094	0.6250	5.027
1.4375	2.185	0.5625	5.585
1.3750	2.285	0.5000	6.283
1.3125	2.394	0.4375	7.181
1.2500	2.513	0.3750	8.378
1.1875	2.646	0.3125	10.053
1.1250	2.793	0.2500	12.566
1.0625	2.957	0.1875	16.755
1.0000	3.142	0.1250	25.133
0.9375	3.351	0.0625	50.266

SOME PULLEY HINTS.

The covering of a pulley is not a difficult task if handled properly, according to the American Blacksmith. First remove the old cover and renew the wedges if the latter be used. Select a piece of leather of good quality, a little wider than the member to be covered and three or four inches longer than will go around the wheel. Place the covering in luke warm water for an hour or so until it becomes soft and pliable. Square one end and nail it to the wedge, using nails just long enough to clinch as they pass through the wedge and strike the body of the pulley.

Then take a clamp of some kind, wood preferred, and apply to the covering; with a pry stretch the covering up to the next wedge and nail as with the first end. Continue this operation until the last wedge is reached, when the few extra inches left on the cover will come in handy in fastening the clamp. After nailing the end of the last wedge, cut to the proper length and trim the edges to the leather down to the rim of the pulley and the job is complete. In case wedges are not used and the covers are riveted onto the pulleys the same method will be found to be applicable.

In order that a pulley be keyed properly to a shaft a key must be of equal width its entire length, and fit the seats on the shaft and in the pulley very accurately. The thickness should vary just enough to make the taper correspond with that of the seat in the pulley. In driving the key it should be driven just tight enough so that it will not work loose. In most cases the hubs of the pulleys run against boxes, and keying these on, about .03125 inch should be left between the box and pulley, for in driving it tight up against the former it would have a tendency to heat and reduce power. In case the key is too thin, but fits otherwise quite well it may be made tight by inserting a strip of tin between it and the bottom of the seat in the pulley.

Polish for Varnished Work—To renovate varnished work make a polish of one quart of good vinegar, two ounces butter of antimony, two ounces of alcohol, and one quart of oil. Shake well before using.

TRUING CRANKSHAFT BEARINGS.

Sometimes the repairman whose machine equipment is limited to an ordinary centre lathe is called upon to remove scores and true up a crankshaft, and the following method is recommended by the owner of a small shop: Place the crankshaft between the lathe centres, then fix a tool in the slide rest and run the latter up into line with the main bearings. The point of the tool is next moved just clear of the forward bearing, at the same time pulling the lathe belt in the reverse direction for cutting, so that the point of the instrument will not injure the shaft. If the latter be revolved at a good rate, the slightest deviation will be noted in the space between it and the tool.

If the shaft be somewhat out of true, it may be advisable to take a slight cut off it, and afterwards smooth up with a file and emery cloth. If it be scored but slightly a smooth file and emery will be sufficient. For the large end bearings an alternative is to lap them with emery cloth and oil placed between a wooden clamp as shown at Fig. 2 D. The device consists of two pieces of wood about the same width as the metal, and of sufficient length so that when in operation the cranks, as they revolve, will not touch the ends.

Each section of the wood is bored to suit the diameter of the work, and a small leather hinge utilized for the purpose of coupling the pieces together. The emery cloth is inserted inside the hole, and the clamp attached and held, running the lathe at a medium speed. The emery will reduce the unevenness of the metal. Should the bearings be a little oval, the highest points will no doubt be found on the sides, owing to the thrust of the connecting rod which causes the top centres to wear. In such cases the high point on the shaft should be eased with a file. In using the lapping tool care should be taken not to squeeze it too tightly as the emery will score the metal.

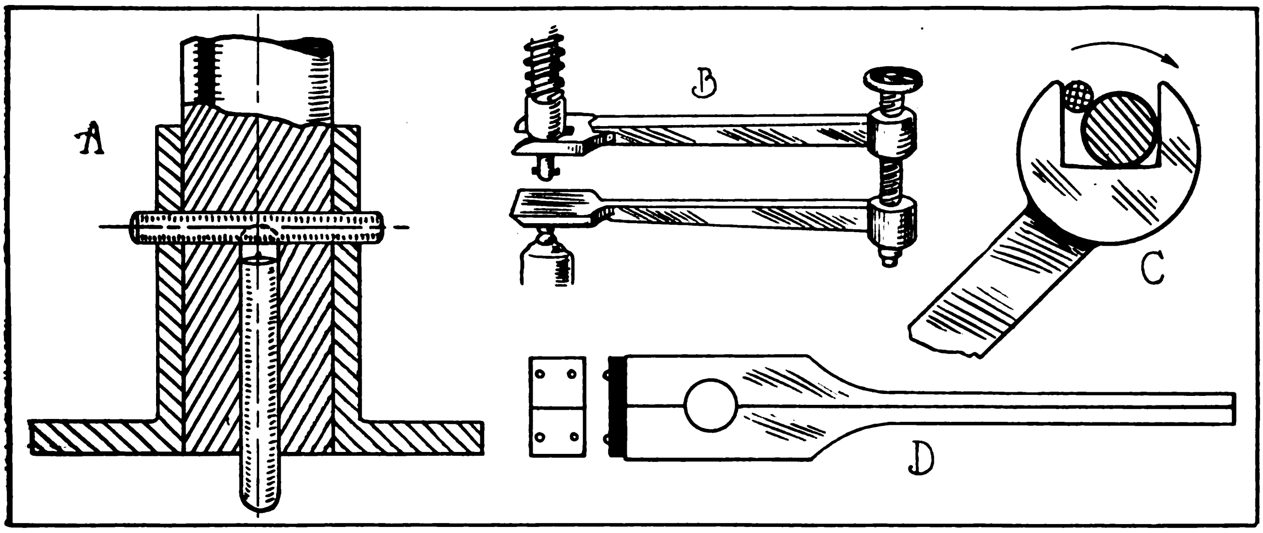


Fig. 2—Some Repair Shop Hints: A, Method of Swelling Shaft to Retain a Coupling; B, New Type of Valve Lifter; C, Utilising a Wrench and File to Remove Broken Studs; D, Lapping Tool Applicable to the Lathe in Smoothing Up Crankshaft Bearings.

TIGHTENING A LOOSE COUPLING.

A repairman was called upon to fix a coupling which originally had been shrunk on a gearshaft and had become loose. The member was removed from the gearbox and a taper hole bored up the shaft to a depth of about two inches as shown at Fig. 2 A. The taper was one of two degrees, and the hole at the end was .5-inch bore. A cast steel pin was then turned of such dimensions that it would only go into the opening for about .75 inch. The shaft end and coupling were then heated to a dull red, the taper pin inserted and given a sharp blow with a hammer. This caused the former to enter for about 1.5 inches, which swelled the shaft to such an extent that it gripped the coupling quite firmly.

INEXPENSIVE COTTER PULLER.

When one of the jaws of a straight wrench becomes broken the usual practise is to throw it into the scrap heap. Some of these tools may be made into a handy cotter pin puller with very little trouble. If the broken jaw be ground off flush with the recess, and the good part down to a long, slim point, the rocking motion that is given to the tool by the shape of the jaw will make removing cotters easy.

MAKING THE VALVE CAPS TIGHT.

In some cars the valves are as large as they can be made, and consequently the seating for washers is reduced to a minimum, and only narrow section members may be used, difficulty being experienced in making the valve caps compression tight. Several ingredients will bring this about, but when the members have to be removed heat may be needed before they can be loosened.

An excellent mixture is that of turpentine and flake graphite and if the washers and members be smeared liberally and tightened, they will not leak and may be taken out easily. The material may be used to paint the exhaust manifold. This is accomplished with a piece of waste dipped into the mixture and rubbed over the metal when the latter is hot. It will impart a beautiful polish to the pipe.

NEW TYPE OF VALVE LIFTER.

A new type of valve lifter has been brought out by an English concern as illustrated at Fig. 2 B. It consists of two arms, one of which is flat and the other slotted. The latter is placed under the valve spring retainer and is lifted by turning a small wheel which is fastened to a threaded bolt.

TESTING SOLDER.

To ascertain whether solder is of good quality, hold it up near the ear and bend it. If it cringe or make a crackling noise, it is good; otherwise it is an inferior grade. It can be made by melting equal parts of block tin and lead in a ladle. It should be stirred and run off into a mold to cool.

NEW GASOLINE FILTER.

A new gasoline filter and one that is claimed will absolutely separate every particle of foreign matter or water from the fuel, has been brought out abroad. The device, which is depicted at Fig 3 A, in outward appearance is similar to the ordinary filter, and has two pipes leading to it, the one at the right in the drawing being the supply tube. This extends downward below a cone-shaped gauze attached to which is the tube conveying the fluid to the carburetor. The fuel enters below the strainer and passes through this and the outlet.

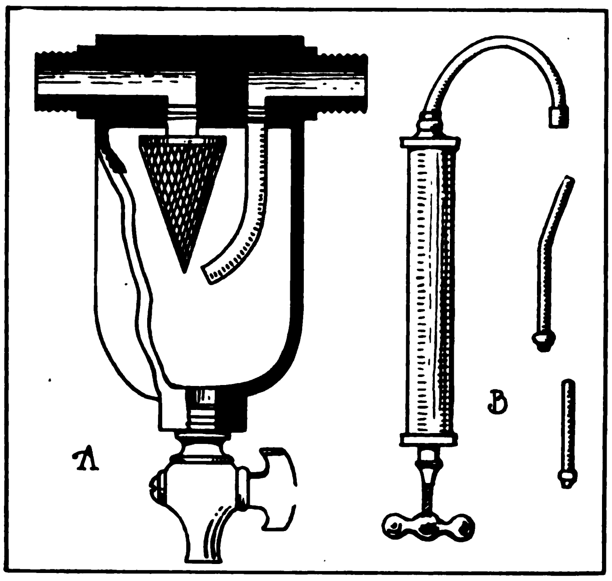


Fig. 3—A, New Form of Fuel Filter; B, Grease Gun Fitted with Flexible Nozzles.

FLEXIBLE GREASE GUN.

The design of some machines is such that it is difficult to insert lubricant with the ordinary grease gun. A new device which permits inaccessible places to be reached easily is being marketed as outlined at Fig. 3 B. It consists of the usual grease pump but is fitted with flexible nozzles which facilitate the operation. These members are made in sections and can be screwed together, forming a long connection. The instrument is made so that either oil or a grease may be used.

MOTOR KNOCKS AND SPARK PLUGS.

With the general use of the magneto as the chief component of the ignition system some repairmen having had long familiarity with the trembler coil are careless about the gap at the points of the spark plug. One workmen with a long and varied experience of cars and their peculiarities was puzzled by the eccentric running of a four-cylinder motor brought into the shop by a customer. The engine was very difficult to start, and when under way ran without balance, as if two cylinders were developing about double the power of the others.

He verified the compression, tested for auxiliary air, overhauled the magneto, etc., and finally confessed he was baffled. As sometimes is the case, a repairman from a neighboring shop walked into the garage and quickly solved the problem. Picking up the spark plugs, he set the gap of each to an accurate measurement. When replaced the motor ran perfectly. Ordinary spark plugs had been fitted and three of the electrodes of these had been burned away by the hot spark, increasing the air gap and causing the erratic operation of the power plant.

FORCING RACES IN PLACE.

Removing ball races on certain types of cars is sometimes a difficult task, especially when the members are a drive fit and have been worn through so that a recess is present in the shell or housing into which they set. The writer recalls a machine of 1907 design which was brought into a repair shop with one of its front wheels wabbling and upon examination it was found that the balls had crushed through one section of the race and into the supporting member.

Considerable difficulty was experienced in removing the worn part as it was of hardened pressed steel. By judicious use of the cold chisel it was chipped out without much damage to the housing, but when an attempt was made to fit the new race it was found that it could not be driven in without danger of breakage. The seat was smoothed up by removing the ridges and the metal ground off slightly to start it in its seat. A bolt, threaded at both ends to take a nut, and two .25-inch metal plates, were utilized as shown in Fig. 4. The race was drawn into place by tightening the nuts, and it was forced in straight as an even pressure was brought to bear.

Sometimes it is not possible to drive out the part or break it and when such is the case the temper will have to be drawn and a series of holes drilled after which removal will be an easy matter. If it can be started by driving sufficiently to enable the placing of a small piece of metal between it and the seat, a few smart blows of the hammer on a cold chisel will fracture it.

In replacing worn bushings of brass or bronze with new ones the usual method is to drive them in with a hammer and block of wood or lead. If it be a snug fit and the place inaccessible there is danger of burring up the part, also of its not going in true. They can be forced into place by utilizing the bolt and washers as outlined in the sketch.

SECURING WOOD SCREWS.

Wood screws are utilized in the construction of automobiles and sometimes they work loose, especially in the body. When such is the case they can be prevented from turning by using a small staple such as is employed in fastening wire netting. The staple is driven into the wood in such manner that the flat part of the former enters the slot in the head of the screw and locks it securely.

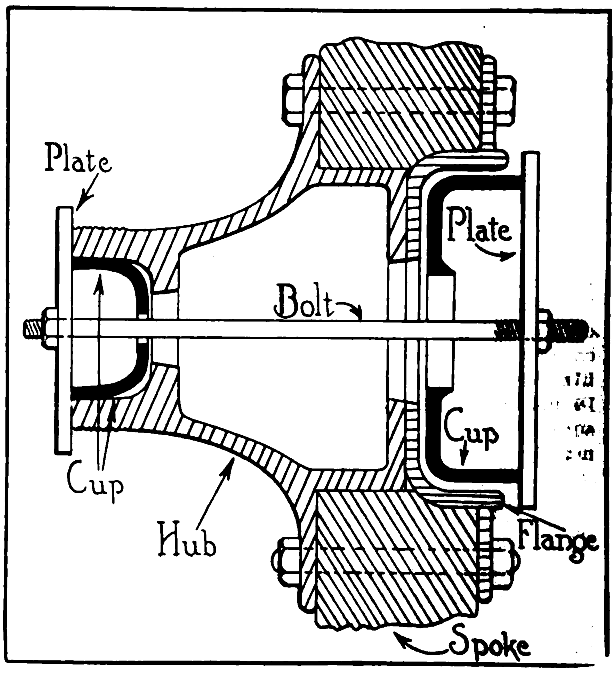
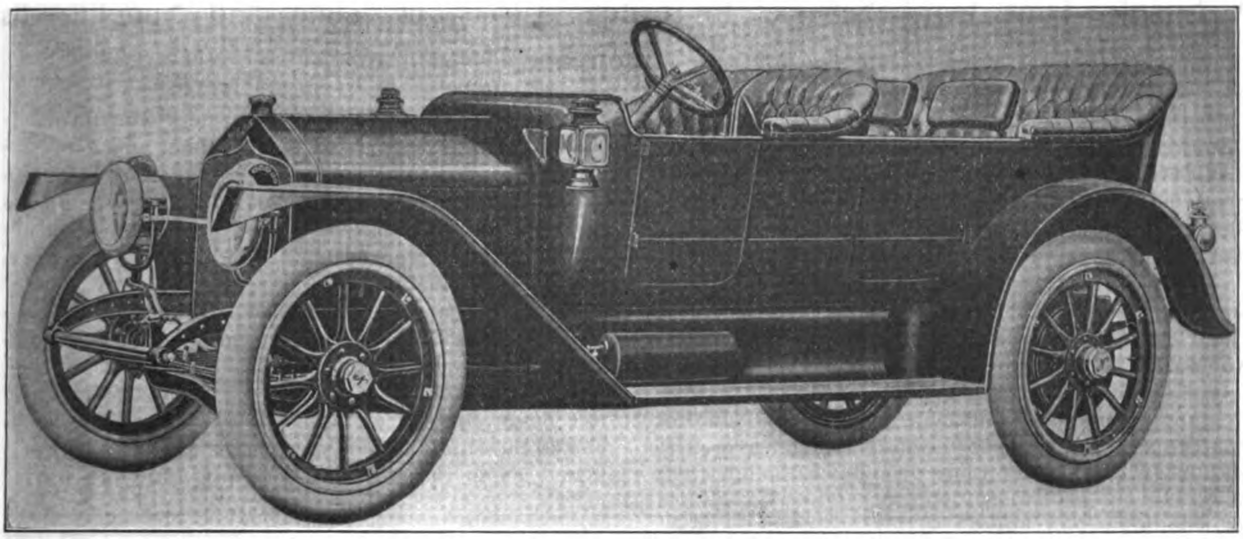
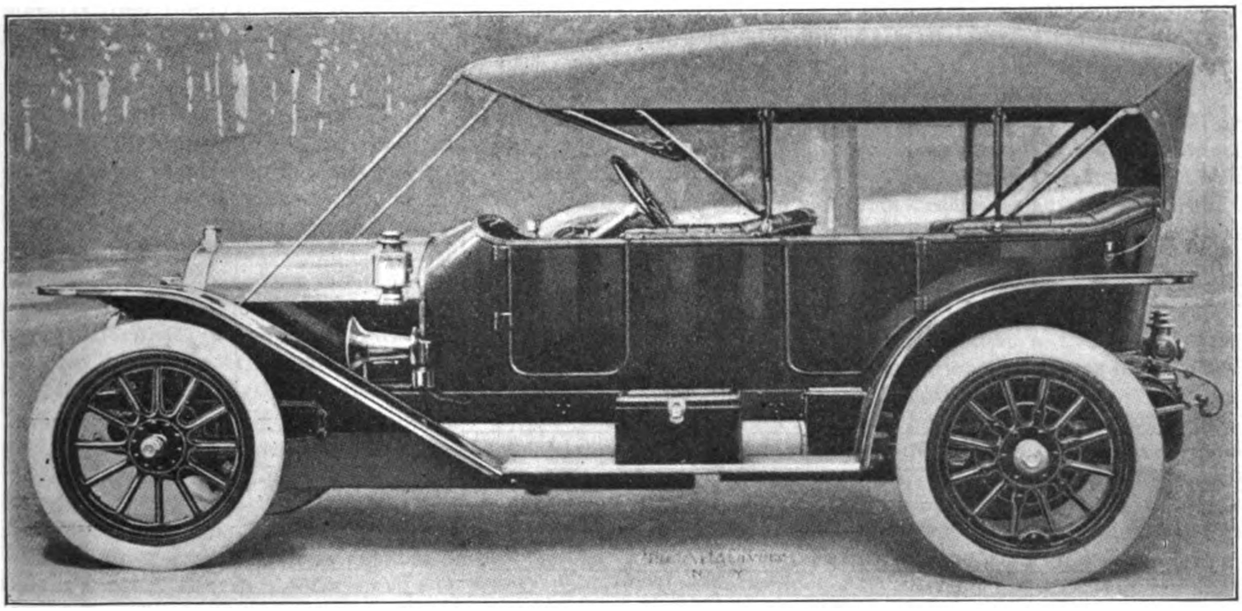


Fig. 4—Utilizing a Bolt to Draw Ball Race Into Wheel Hub.

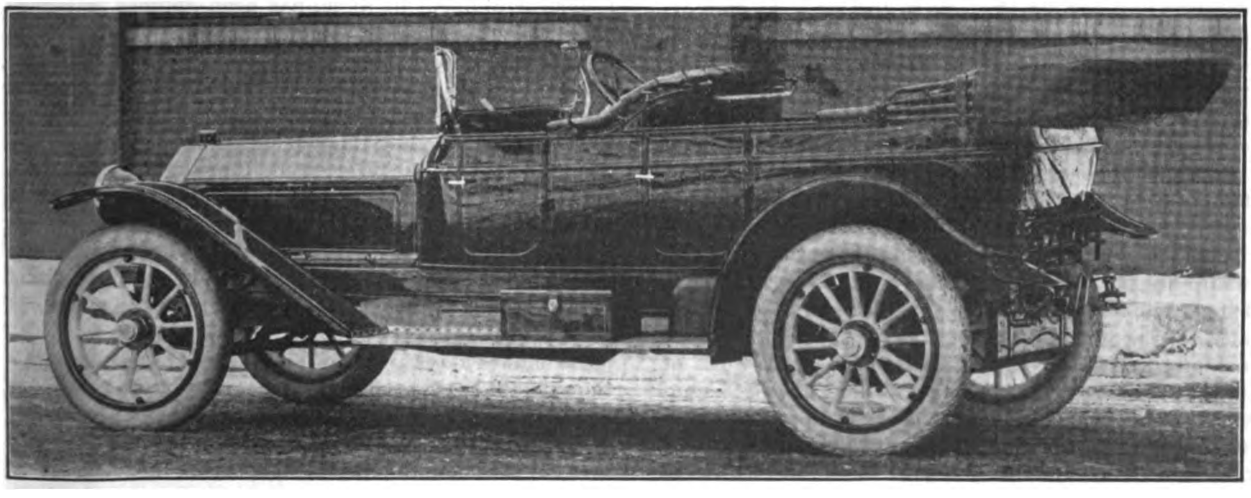
ATTRACTIVE LINES FOR LIVE AGENTS.



Seven-Passenger National 40 Touring Car Equipped with Four-Cylinder 40 Horsepower Motor—Price, $3000. Made by the National Motor Vehicle Company, Indianapolis, Ind.



Mercer Four or Five-Passenger Touring Car, Type 35, Series A and B, Known as the Newport Model. Horsepower, 32.4; Price, $2750.



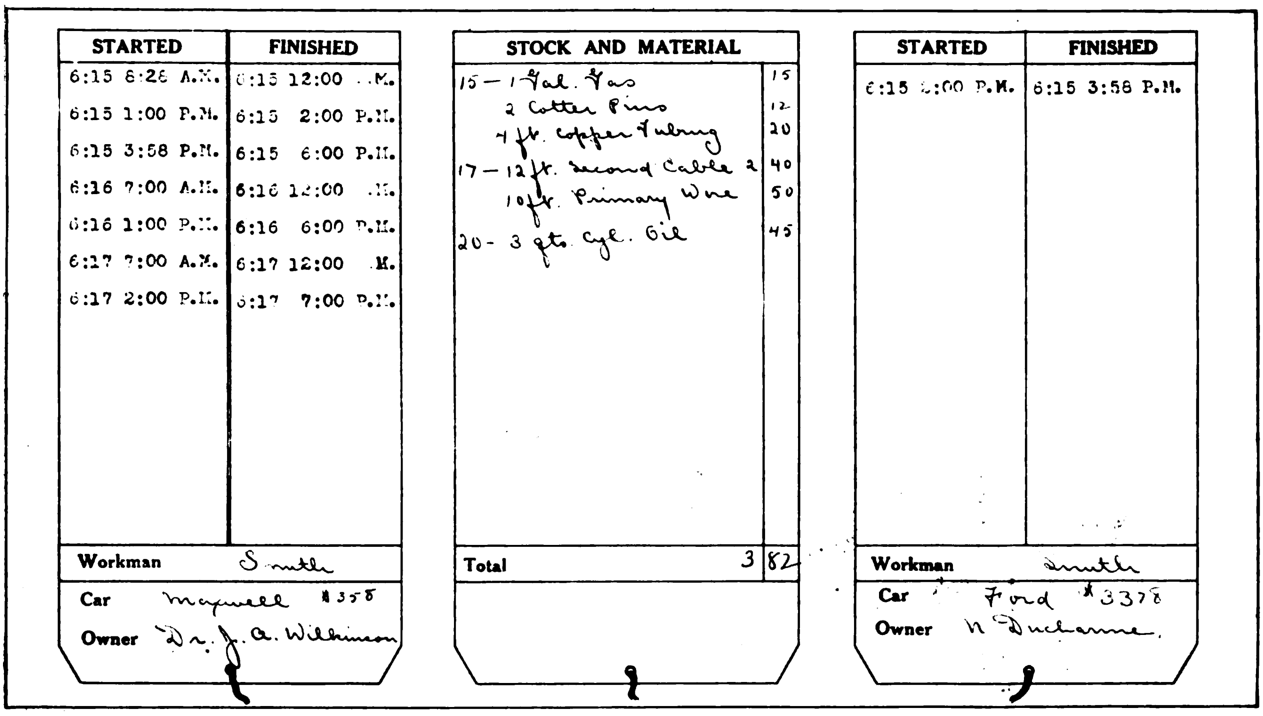
Peerless "48-Six" Touring Car—Motor, Six-Cylinder; 48 Horsepower. Made by the Peerless Motor Car Company, Cleveland, O. Price, $5000.

SYSTEM FOR A SMALL GARAGE.

A Simple Time Card Scheme to Catch Leaks in Time and Supplies---Its Benefits to the Shop and Customers.

With the rapidly increasing number of motor cars in service, both for pleasure and business purposes, means must be provided for their care and maintenance. There is and always will be a demand for repair shops employing skilled workmen and in this respect it may be stated that the small shop, when properly equipped, may compete successfully with the larger and more established concerns. Many of the latter began operations in a small way with one or two workmen and through diligence and practical methods built up a profitable business.

Many competent workmen, thoroughly familiar with the motor car and its needs, have endeavored to establish a business of their own but although their work was entirely satisfactory to the trade as employees, they have failed to attain success in their new venture because of a lack of executive ability. Four or five skilled mechanics might decide to establish a repair shop, and while capable of undertaking and completing successfully any work, might fail to hold their trade because of a number of reasons, some of which will be outlined herein.



STARTED	FINISHED
6:15 8:28 A.M.	6:15 12:00 M.
6:15 1:00 P.M.	6:15 2:00 P.M.
6:15 3:58 P.M.	6:15 6:00 P.M.
6:16 7:00 A.M.	6:16 12:00 M.
6:16 1:00 P.M.	6:16 6:00 P.M.
6:17 7:00 A.M.	6:17 12:00 M.
6:17 2:00 P.M.	6:17 7:00 P.M.

Workman Smith
Car Maxwell #358
Owner Dr. J. A. Wilkinson

STOCK AND MATERIAL	
15 — 1 Gal. Gas	15
2 Cotter Pins	12
4 ft. copper Tubing	20
17 — 12 ft. Second Cable 2	40
10 ft. Primary Wire	50
20 - 3 qts. Cyl. Oil	45
Total 3	82

STARTED	FINISHED
6:15 2:00 P.M.	6:15 3:58 P.M.

Workman Smith
Car Ford #3378
Owner N. Duchanne.

Fig. 1—Depicting Time and Labor Checking System, Showing Start and Finish of Work, Reverse Side of Card for Material, and Tag for Workman Called Off to Attend Another Customer—It Will Be Noted That Each Minute Is Accounted for by the Time Stamp.

Example of Failure.

Assume that three expert repairmen form a partnership in the repair business. One is particularly efficient upon motors, while the second makes a specialty of the components of the chassis, is a skilled machinist and fully capable of handling any work of this nature. The third member of the firm is a general all-around man, clever at locating motor car troubles as well as proficient with ignition and carburetion. Such a combination should be able to establish a paying business.

It is natural to presume that the nucleus of the new trade will consist of those owners who have followed the workmen from their former place of employment. Personal solicitation and friendship also proves a valuable asset in securing a large clientele and in a short time the new firm appears to be established upon a sound basis and its members are working overtime, including Sundays.

Leaks and Overhead Expenses.

To reduce the overhead expenses as much as possible the new concern dispenses with a bookkeeper, one of the firm filling the office, the only salary paid out being that of an apprentice who runs errands, cleans the cars and acts as an assistant to each workman. From the start the company, although having a good equipment of tools, has been obliged to secure supplies and material which makes deep inroads into the capital.

At the end of the month the firm proceeds to take an account of its financial standing, and although the books show that the business for the month has been all that could be desired, there appears to be a shortage of ready cash, and it is probable that one member of the company will begin to compare his financial standing with that of the past when on Saturday he received his envelope with its regular sum of money and frequently its contents were swelled by reason of overtime.

A month later the firm discusses its business. Although all have been working overtime to turn out the work and new customers have been secured, after paying the lighting, power, telephone and supply bills, it may develop that the amount of cash available when divided into three parts, proves to be a small salary and particularly discouraging when the overtime labor is taken into consideration. The books show a handsome profit, but many of the outstanding accounts are hard to collect and several are discovered to be almost worthless.

As a result the clerical member of the firm takes an account of supplies and goes through the books and begins to check up material and compare that on hand with that charged. He is apt to discover that there are many leaks. The books show that during the month 500 gallons of gasoline were purchased and that 200 were charged up. The tank reveals but 250 on hand, leaving 50 gallons unaccounted for. The oil question is next looked into and a similar discrepancy discovered. Other supplies also show a balance on the wrong side of the ledger, small amounts it is true, but when figured on a yearly basis they total a considerable sum.

Lack of System.

The bookkeeper decides to check up stock at the close of each day. It has been customary for each workman to make up his time slip and material account at night, relying upon his memory for details. Taking each slip the bookkeeper compares the charges with stock of fuel and oil and discovers a shortage of five gallons of gasoline. One member of the concern recalls having put this amount in Mr. Blank's car. Another refilled the crankcase of a motor and told the boy to enter it at the office. Another sold a gallon and put the change in his overalls. Although each member resolves to remedy the faults, the errors occur frequently, eating into the profits.

The new concern also learns that considerable diplomacy is required in handling customers and that some of its trade is taking work to other shops, the result of one member completing work ahead of another customer whose car should have been turned out first. Work promised is not delivered on time, creating dissatisfaction, as well as numerous other minor difficulties which could have been avoided if the firm in its anxiety to please had been more conservative in its estimation of time and labor.

Need of Management.

A small concern operating under these conditions will not be successful, unless one member possesses executive ability and the others agree to conform to his orders, discussing each step before it is taken. While such a combination is capable of accomplishing satisfactory work, it must have the proper management. The same workmen, when employed under a capable foreman, in a large shop, observe the rules and maintain the system in vogue. They have their instructions and follow them.

The writer personally knows of cases where a skilled repairman established a shop of his own and for a while was very successful, but failed to hold his trade because of his lack of executive ability and diplomacy. Unconsciously he favored certain customers, which was noted by others who naturally became dissatisfied. This same workman, who later became identified with a large concern, was one of their best employees, giving perfect satisfaction to customers he failed to please when in business for himself.

Labor and Check System.

It is conceded by those familiar with the operating conditions of the repair shop employing two or more workmen that more or less difficulty is experienced by the proprietor in keeping an accurate account of the time and material utilized by the employees. This is meant to apply to the shop not equipped with a system, and which is experiencing a steady growth of business compelling the owner to add to his force from time to time and especially during the busy season.

Under such circumstances the new men are prone to emulate the example of the older employees in making up their time at the end of the day's work, which if it consist of 10 hours results in like number being charged up to one or several jobs as the case may be. Material and stock is charged in a similar manner. Operating under such conditions is bound to be costly to the proprietor in more ways than one.

Faulty Time Keeping.

Not only is the workman liable to forget minor charges, but if he is called upon to work on a number of jobs during the day he cannot very well remember the exact amount of time on each unless possessing a wonderfully retentive memory. If the workmen compute their time at the completion of the day's work, they are interested only to the extent of accounting for 10 hours' labor, a method which may be satisfactory to the proprietor, but not to the discriminating customer.

For example: Mr. Brown brings his car to the shop to have the valves ground and wants his machine that afternoon. Being a good customer and the work permitting, the job is promised, and Mr. Brown sees the work started. An hour afterward he passes the garage and notes the same repairman working on a car in the street. Repassing the place still later he finds the street job is not yet completed. That afternoon Mr. Brown gets his car and asks for his bill. He notes the time for labor and does a little figuring and is of the opinion that he is paying for some of the other owner's work. An investigation results in the workman "remembering" working on the other car. The bill is corrected, but Mr. Brown is developing an idea that he has not been given a square deal or else that the shop is not conducted in a business manner.

Sometimes it happens that a customer disputes the amount of labor on a job and demands an itemized account. These little difficulties are not uncommon and often a recourse to the courts is had to obtain an adjustment. Although to be regretted, it is a fact, nevertheless, there are many arguments over repair bills which might have been avoided if the shop maintained a system by which the owner could be shown an itemized account of the time and material, also that he could not be charged for labor not his or due to the absent-minded or careless workman.

Such a system should include means for checking the time of the workman hourly and in fractions thereof, as well as for all material and stock utilized. In large shops cards or sheets with duplicates are employed and the small details looked after very carefully. In the event of disputed work the records are valuable as evidence.

Many shops hesitate to install some systems because of the expense and necessary clerical labor involved. With small garages, employing three or four men, the proprietor may keep the books and attend to many small details usually looked after by the bookkeeper, etc. With such a concern the system should be as simple as possible yet provide accurate means for checking up the labor and material.

Clocking System.

At Fig. 1 is outlined a system which would not be expensive to install, and in addition to keeping an accurate account of the time spent on each job, would serve also to check up the time of the workmen; that is, denoting the time they began and finished each day. It requires a form of time clock which provides for stamping the month, day, hours and minutes, a device employed by many firms to register the time orders or letters are received and answered. This clock is located in or near the office and is fitted with a rack for each workman, also another holder containing blank cards.

Assume that Dr. Wilkinson drives up to the shop and makes arrangements to have his motor overhauled. The proprietor instructs Smith to start on the job the next morning. Smith is given a copy of the orders entered upon the order book, and upon arrival the next morning takes a blank card and stamps it in the clock device. Smith was late that morning, and the "started" side of the card shows he began work at 8:28. At noon he stops, stamps his time and leaves the card in his rack, restamping it upon his return.

At 2 he is called off by the foreman to do a little work on Mr. Ducharme's car, who has just driven up. Smith goes to the time clock, stamps his card, places it in its holder, takes a new card and stamps it at 2, and enters Mr. Ducharme's name, the type of car and its number, before proceeding to work. At 3:58 he completes his task, returns to the clock and stamps the card denoting that the work was finished at that time. He also stamps the card bearing Dr. Wilkinson's name at 3:58 and resumes work on that job, but leaves Mr. Ducharme's card in the rack. At the completion of the day's work at 6 the card is again stamped and left in the rack from which it is taken by the bookkeeper, entered on the day book and replaced on the clock.

The reverse side of the time card is utilized for entering the stock and material used, the prices of these being carried out and added up by the bookkeeper, and entered in the day book or ledger. The total time is figured easily as well as that of the workman. Upon the completion of the work the card is taken into the office, entered and filed away for reference.

By utilizing a separate card for each job, whether it be for 15 minutes or several days, the customer is assured that some other owner's car is not being repaired at his expense. In the event of a workman requiring the aid of another for an hour or fraction thereof, the time card will show the double time and how utilized. Should the customer desire an itemized bill of the labor, it is made up easily. One time card could be employed for a job taking several days or a separate one utilized each day as desired. The system could be made to fulfill a number of requirements and to make it successful it would only be necessary to insist that each workman use a card in connection with the clock upon starting and completing each job, as well as for working hours.

BUSHING PULLEY WITH BABBITT.

A repairman had a 24-inch pulley with a 2.375-inch hole that he desired to use on a 1.1875-inch shaft. Not wishing to wait until an iron casting could be made he laid the pulley, rim down, on the planer table. A short piece of 1.1875 shaft was faced off square on both ends and stood up inside the hole, and a clamp put on the top to maintain it in place. The shaft was then squared with a try-square and a bar of straight steel laid across the upper rim face of the pulley. The pulley was then shifted until it was concentric with the shaft, as near as could be measured with a scale, and clamped. The set screws were turned down until just in contact with the shaft, and the hole filled with babbitt. The pulley ran true within .03125 inch and with the screw holes all tapped. Although not made for a durable job it gave good service for over a year.

DRILLING HOLES IN LEAD.

Drilling holes in lead would appear to be a very easy matter as the metal is soft. However, unless the proper lubricant is employed, where the hole to be made is of any depth, a ragged burr will be thrown up around the top of the aperture which will be thrown out of shape by the "crawling" of the chips. A good grade of lard oil and plenty of it should be utilized and the drill should be lifted one or more times to clean out the chip. With power a speed of 800 revolutions a minute should be employed.

NEW TYPE OF DRY BATTERY.

A new type of dry battery being introduced abroad is said to have a useful life up to three years or more, as it does not deteriorate when not in use, also it will retain its charge for several years. A feature of its construction is that it will permit of recharging several times. A number of zinc plates are utilized for the negative element and for the positive a carbon rod is imbedded in a composition of charcoal and manganese oxide, surrounded by a mixture of ammonium chloride, chloride of lime and zinc chloride. These elements are placed in an electrolyte consisting of amylon, obtained from the sago palm, with exciting salts composed of platinum-ammonium chloride and zinc-ammonium chloride. This electrolyte, which is in the form of a jelly, is claimed to retain its moisture for long periods and to be but little affected by variations of temperature.

CUTTING THREADS ON SMALL SCREWS.

In many shops only long machine screws are carried in stock and when a short one must be used the threads are cut up to the head and the extra length cut from the thread end. When this is done by holding the screw in a vise and using cutters or a hack saw to cut it, considerable filing is necessary to restore the threads to their original shape. If the following method be utilized, this filing is not needed:

A die the same size as the thread is fastened into the holder and the stock clamped in the vise. The screw is threaded into the die, a screw driver being used to force it through, cutting the threads on the shank. After cutting off the extra length the screw is backed out, the die forming the threads back into shape.

At times the screw will twist when cutting threads on the shank especially the smaller sizes. This can be prevented by catching the threaded end in the vise after starting the die and holding the head from twisting with a screw driver while the die is being turned.

SMALL FILE HANDLES.

"Sparklet" bulbs, which are generally thrown away, make excellent handles for small files. The file is held in a vise, the tang uppermost, and the empty bulb driven on with a wooden or lead mallet. If desired, the bulb handles can be lacquered over with brush enamel, to prevent their rusting.

PAINT INDICATING TEMPERATURE.

According to Tollner, a paint that is red at ordinary temperatures and turns black at about 140 degrees Fahrenheit, returning to its original color on cooling, is made from 100 parts each of iodide of mercury and iodide of copper rubbed down carefully with sufficient distilled water to form a spreadable paste.

VALUE OF SPECIALIZED PUBLICATIONS.

Prints of Established Policies as Contrasted with Those Transformed to Meet Publishing Expediency and to Reap Profit in Apparently Promising Fields.

PUBLICITY is sought by the concern or individual primarily because of a desire to promote business. It is assumedly obtained in whatever form will bring the largest measure of results, the medium being chosen after consideration of those available, logically with a basis of economy so far as expense is concerned. While it is not probable that every anticipation is realized there is at least reason for the advertiser to believe that he has received the service he has purchased. In other words it is not always possible for all the results of publicity to be known because of the continuity of business and the fact that transactions resultant from the one notification to the public may be consummated a considerable length of time after publication.

The actual worth of a publication to the publisher is the degree of confidence he has established with business men. This must be based upon the class and number of readers. The fact that prints are devoted to different classes and their interests is the best evidence that no one can serve all. Were this condition reversed there would be only the general newspapers and periodicals. Specialized papers and magazines are not creations for the purpose of deception, but are distinctly developments because of demands not previously supplied.

Just as this condition may be applied broadly it may be specifically stated with regard to industry, to commerce, to the professions, to the arts, to politics, to religion and to science. It may be even further classified. It is not strange that there should be specialization with reference to the motor vehicle industry and trade, and to the promotion of the use of these conveyances. To the contrary it would be very strange were this specializing neglected. But it must be understood that establishing the specialized print is an undertaking of no small proportions, which cannot be accomplished save through bringing to the attention of a class the merits of the publication, and a reputation and prestige once obtained, are too valuable to be sacrificed or neglected. No print of value was ever created in a brief period. Confidence is imperative, and this cannot be acquired save through experience.

There is manifested in publishing today at least the same progression evidenced in other industries. It is true that all have not adopted the same policies and appeal has been made to differing interests. But it is a fact that in the early days of the automobile industry publicity was sought by inventors and manufacturers without much regard for the medium. Then it was necessary to convince the people the mechanical vehicle was practical and perhaps all intelligence served a useful purpose. Prints were then utilized purely for promotion of what was regarded as a pleasure or sport. The public was excited by thrills and "stunts." Competitions were one of the most generally adopted means for attracting the attention of the people.

In the evolution of the industry and the adoption of the automobile vehicle generally it is not to be assumed that the methods originally the vogue were unchanged. With development and expansion the interests were widely extended, until today hundreds of manufacturers, and thousands of selling representatives, to say nothing of those more or less identified with the care and maintenance of cars, as well as hundreds of thousands of vehicle owners and users, may be regarded as the clientele of the publications directly devoted to motor vehicle production and service. And just as these interests are diversified and extended over the nation so is the need of the prints that are specialized for their direct promotion. No one magazine can serve all, even indifferently. No one can, as a business proposition, expect the support of what it does not indorse or promote. As the industry broadens the greater is the need of specialization.

The value of the specialized publication was discounted by publishers who depended upon their personality for advertising patronage; by those who believed that the advertisers would bestow favors and continue the support of whatever might be considered promotion; by those who did not understand that any enterprise must be conducted to recognized principles and to business methods; by those who failed to realize that the strength of their own proposition was what they made it; by those who did not see the possibilities through public recognition.

Within a comparatively brief period the endeavors of some of the publishers of prints to obtain patronage as a specialized publication have not only attracted attention through the industry and trade, but the spectacles have assumed more or less a humorous phase because of the absurdness of the claims made. For instance, a magazine that was decidedly emphatic in its contention that it was devoted to the industry, after an existence of years, suddenly became an owners' publication, it being maintained that the circulation that had been gained in one field could be continued in another in which it had made no attempt to secure subscribers. Quite as remarkable was the lightning change made by a publisher who took over a magazine that was claimed to be an owners' print, and with one announcement he transferred its clientele to the "trade" and a hoped-for increased patronage. Not only this, two magazines that had for years boasted of owners' subscription lists made headlong plunges into a "trade" policy that undoubtedly firmly established their values without regard for the subscribers.

There is usually some reason to doubt a statement not supported by fact, yet the public is expected to believe that as a publishing proposition a publication can change its subscribers at will, and have equal or greater strength than before. Logically there can be but one conclusion, and that is the publishers hoped for greater profit, and any reversal of policy must be a confession of weakness or failure. Besides, if success could not be gained in one field after long and continued endeavor it is difficult to reconcile the statement that attention to another class has accomplished it through a mere announcement. One might say that a pleasure car was a truck, but it would be difficult to convince a purchaser that the argument was well founded. Publications may change their policies, but it is evident enough that there must be a sufficient period of development to establish a strength and support. Instantaneous transitions do not inspire confidence when it is understood that with any reputable print the advertising value is based entirely on the number and character of its subscribers.

Perhaps it might be wise to consider the subscribers for a moment. It is certain enough that those who are owners have no concern in matters relating to the industry and the trade. They have undoubted interest in subjects relating to their own pleasure, which are not in the slightest degree of a trade character. It might be that the trade would have a casual concern in whatever would indicate public demand or sentiment, but aside from this the magazine for the owner would be a matter of indifference to those engaged in trade.

The value of the specialized magazine cannot be too highly estimated by the industry and the trade, but it is idle to assume that the interests of each class represented can be equally well served by a single publication. It was recognition of this condition that established The Automobile Journal as a magazine devoted to the owners in the broadest sense. As the demand became apparent the Motor Truck was published for the promotion of the use of the service vehicle, there being a careful attention to details of a character that has caused its recognition as an authority. The proportions of the industry and the trade, and the necessity of a medium for the dissemination of industrial and trade intelligence, impelled the establishment of the Accessory and Garage Journal.

These publications have been developed to carefully determined policies. The lines of demarcation have been well established and the three prints have been given over to separate and distinct fields in which the interests are large and are increasing.

The distribution of these magazines has been developed wholly upon their value to the subscribers. The contents have been prepared with special reference to the readers and the subjects have unusual interest. No opportunity to improve has been neglected. The development has been always with a view to giving publications that are worth to the readers more than the prices charged. It has never been necessary to promote them with gifts, premiums, extended subscriptions, and other inducements, which, while possibly regarded as free by those receiving them, must be paid for by the subscribers.

It might be well enough to emphasize that instead of changing the policy of any magazine and directing attention to any particular interest, and claiming especial influence with that clientele, these fields have been regarded as each requiring separate publications. That is to say, instead of policies to justify the endeavors of advertising solicitors, without quality of contents to support any logical argument, these magazines have been devoted to the interests of the subscribers, constantly and consistently; instead of policies dictated by expediency, or to temporarily meet the competition of another print, and the claim that a distribution was to any particular class an advertiser desired to make appeal to, the magazines were strengthened with reference to those for whose benefit they are published.

The Automobile Journal has always been devoted to the interests of the owners of pleasure automobiles. It has always been given over to subjects concerning them and their pleasure. More than 90 per cent. of its distribution reaches owners direct. The influence of the owner with his associates is the most potent factor in the legitimate promotion of the use of the motor car.

The Motor Truck is generally promotive of the manufacture, sale and use of the service wagon. It is a reflection of practical conditions in that it deals with experiences and actual usage, with all types of transports, affording information that is not only exceedingly valuable, but is obtainable in no other form save through personal investigation. It is an authority from every point of view and is so regarded by every interest, while its influence is world wide.

The Accessory and Garage Journal is distinctly a trade publication. It is the only print of its kind in the country, for it is devoted exclusively to the motor vehicle and allied industries and the trade. The information it contains is the specialized intelligence that cannot be obtained through other channels. It is a dependable authority because all facts are verified.

All advertising in any of these three publications under yearly contract are listed, with name, address and branches, under appropriate classification in the Buyers' Guide or Trade Directory published in each magazine, without additional charge. This list is not vague or uncertain. It is select from every point of view, giving every reader a reference revised with each issue, composed of the best and most representative firms producing or distributing vehicles, accessories, supplies or equipment. Practically everything desired may be obtained should there be no personal representative. Instead of the general trade directory with names of thousands revised several times a year, and reaching a comparatively small number, this list is given 48 revisions annually, and besides the circulation in the magazines is included in the series of 10 standard automobile mechanical handbooks, of which more than 300,000 were published last year. The circulation of the directory will reach more than 850,000 the present year, without considering the phenomenal increase in the sales of the handbooks during 1912.

The Trade Information Exchange conducted by the Accessory and Garage Journal is a buyers' and sellers' confidential service, free to all automobile dealers, accessory and supply dealers, garage and public service station owners, and repairers, regularly subscribing to the Accessory and Garage Journal, and to all concerns listed in the Buyers' Guide published in The Automobile Journal, Motor Truck and Accessory and Garage Journal. It is the only service dealing with information of the motor vehicle and allied industrial and trade interests. It places the purchaser in possession of accurate and dependable facts relative to any condition of all the trade, and it affords the producer or distributor the same selling knowledge of the entire market instead of a few channels for distribution. This exchange was created for the benefit of the interests specified and its fullest resources are at the command of its members as frequently as they care to avail themselves of them.

TITANIUM FOR STEEL.

Titanium promises to be largely used in the steel parts of automobiles, according to B. C. Spitzley of the Abbott Motor Company, Detroit. It is now being used in steel rails with excellent results, the New York Central having found that such rails in service lost in weight but one pound a yard when ordinary steel rails lost three pounds a yard. The titanium rails are tougher and have a higher tensile strength than rails of ordinary steel. The cost of treating steel with titanium is but 75 cents a ton, and the increase in tensile strength amounts to 20 per cent.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from April Issue.)

Continuing the description of the Eisemann magneto, the high-tension current produced in the secondary winding of the armature is supplied the collecting ring mounted on the driving end of the armature shaft, and protected from contact with any of the surrounding metal by a vulcanite spool. A carbon brush bears against the collecting ring and the current is then conveyed by the metal brush holder, which is also insulated by a vulcanite bushing through the conduction rod leading to the rotary distributing finger in the secondary distributor. This member contacts with the different segments to which the sockets for the plug jacks are connected. It will be evident that the bearing at the driving end of the armature shaft is a bronze bushing and that the distributor also runs on a long plain bearing. The safety spark gap is mounted at the driving end of the instrument and is housed on the armature cover plate extending over the pole pieces. One terminal of the safety gap is attached to the cover plate bridging the poles and is thus in direct electrical contact with the ground; the other, which is carried at the top of the device and insulated from the surrounding metal by an air gap below and by a vulcanite cover in which it is imbedded, is coupled to the connector bar joining the high-tension collecting brush and the revolving distributor finger. The terminal at the front end of the contact breaker cover is the member to which the ground wire leading to the switch is attached.

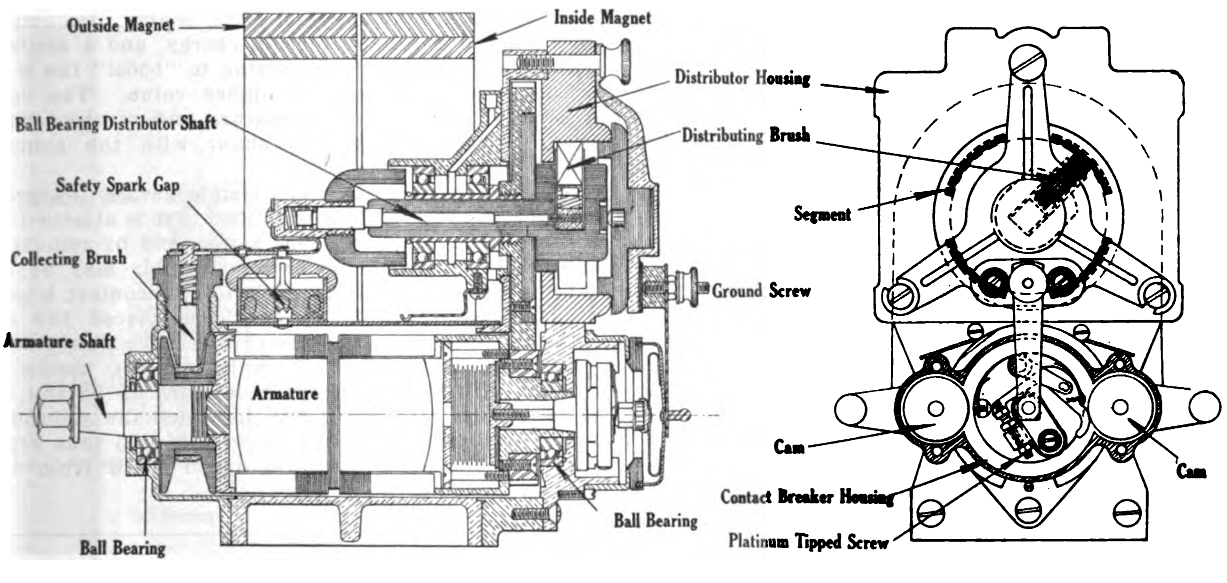


Fig. 33—Principal Parts of Simms S D 4 High-Tension Magneto Generator.

Features of Simms S D 4 Instrument.

The Simms magneto, which is shown in section at Fig. 33 with all principal parts clearly marked, is a direct high-tension device operating on conventional lines, having a double wound armature. The diagram clearly shows the general arrangement, while the sketch explaining the system of wiring at Fig. 34 shows the various connections clearly and the relations of the different important components.

One of the low-tension armature windings is connected to the armature core, and thus to the frame of the magneto, and the other end is led through the hollow spindle of the armature to the contact breaker, the fixed portion of which is insulated, and carries a platinum pointed screw. The bell crank lever carries a second platinum pointed screw and is connected to the frame of the magneto. Both the bell crank lever and the contact piece, together with the contact breaker disc revolve solid with the armature, and as the end of the bell crank lever comes into contact with the rollers of the timing lever, the two platinum screws are caused to break, owing to the bell crank lever rocking on its axis. This sudden interruption of the primary or low-tension circuit induces a current of very high potential in the secondary or high-tension circuit, and gives a flaming spark of great heat at the points of each of the sparking plugs in turn.

The brass cover of the contact breaker is insulated from the frame of the magneto, but is connected by an inside spring with the screw holding the contact breaker in position. The brass cover is held by a flat spring, at the upper end of which will be seen a milled nut, and this screw should be connected to the insulated terminal of an ordinary single pole switch. One terminal of the switch should be connected to the frame of the car. It will thus be seen that for one position of the switch, the nut (which represents one end of the primary armature winding, the other be-

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

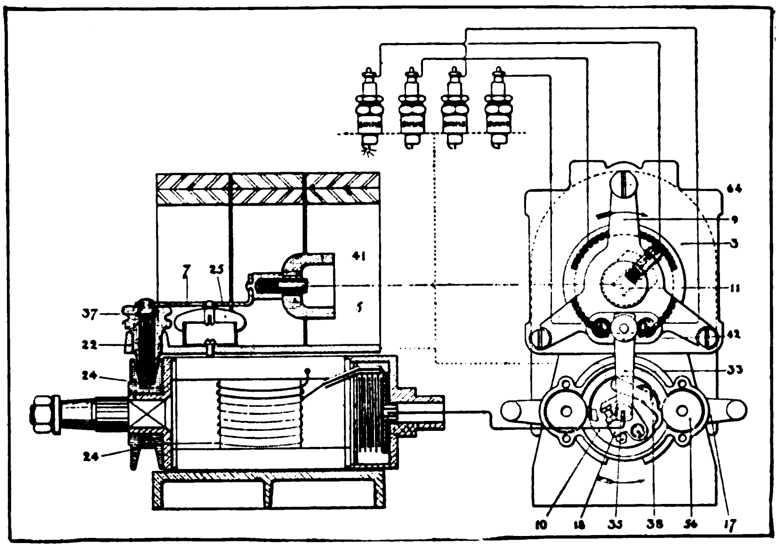


Fig. 34—Arrangement of Simms S D 4 Magneto Wiring.

ing permanently connected to the frame of the magneto) is still insulated, but in the other position is joined to the frame of the car, thus earthing both ends of the primary armature winding, and causing the magneto to become inoperative, and consequently stopping the engine.

The high-tension winding of the armature has one end connected with the primary or low-tension winding, and through this winding to earth, the other end of the high-tension or secondary winding being connected to the collecting ring from which the current is collected by the carbon brush, and thence passes along the conducting bar to the distributor carbon holder, which revolves and distributes the high-tension current to the four segments of the distributor and thus to the four high-tension sparking plugs.

Close to the carbon holder will be observed a porcelain dome forming a cover to the safety gap chamber attached to the aluminum lid. Inside this dome, and connected to the base of the chamber, will be noted four small points. Four similar points will be found inside the porcelain dome. Electrical connection to the sparking points in the porcelain dome is made from the conducting bar. This device serves as a safety spark gap and is utilized to prevent breakdown of the armature winding insulation if a plug wire should become uncoupled, as described elsewhere in this discussion.

Herz Arc Flame Magneto Compact Type.

The Herz-Ruthardt magneto is a simple, compact and efficient device that is somewhat different from the conventional forms, the magnets producing the field for the armature being of distinctive design and high efficiency. The general construction of the device used for four-cylinder motors is shown at Fig. 35, the various parts making up the assembly being marked to facilitate identification.

In this instrument, the magnets are forged of steel, in the form of discs about .5 inch in thickness. These are properly hardened to retain the magnetism and are then ground on the faces till they are absolutely true and are then placed face to face and held together by through bolts. The magnets are of such shape that the usual cast iron pole pieces are eliminated, the armature being ground to fit the space between the magnet poles. The end casings of the magneto are aluminum and carry the annular ball bearings used to support the armature and distributor shafts.

The armature is made of plates of soft Swedish iron, and is a double wound form, coarse wire acting as a generator for low-tension energy, and a secondary coil of fine conductor serving to "boost" the low-tension current to one of higher value. The condenser is built into the armature and revolves with it, its terminals being in shunt with the contact points.

The contact breaker is a simple device, the principal parts being carried on a disc that is attached to the armature shaft with one screw, and by removing the fastening device the entire assembly may be removed easily. The casing enclosing the contact breaker disc has two hardened steel cams placed 180 degrees apart. As the armature revolves, the fibre roller, which is loosely mounted on its spindle, comes in contact with the stationary cam, rides up on the incline, carries the spring arm to which the grounded platinum point is attached up with it, and thus separates the insulated platinum tipped screw from the contact on the spring.

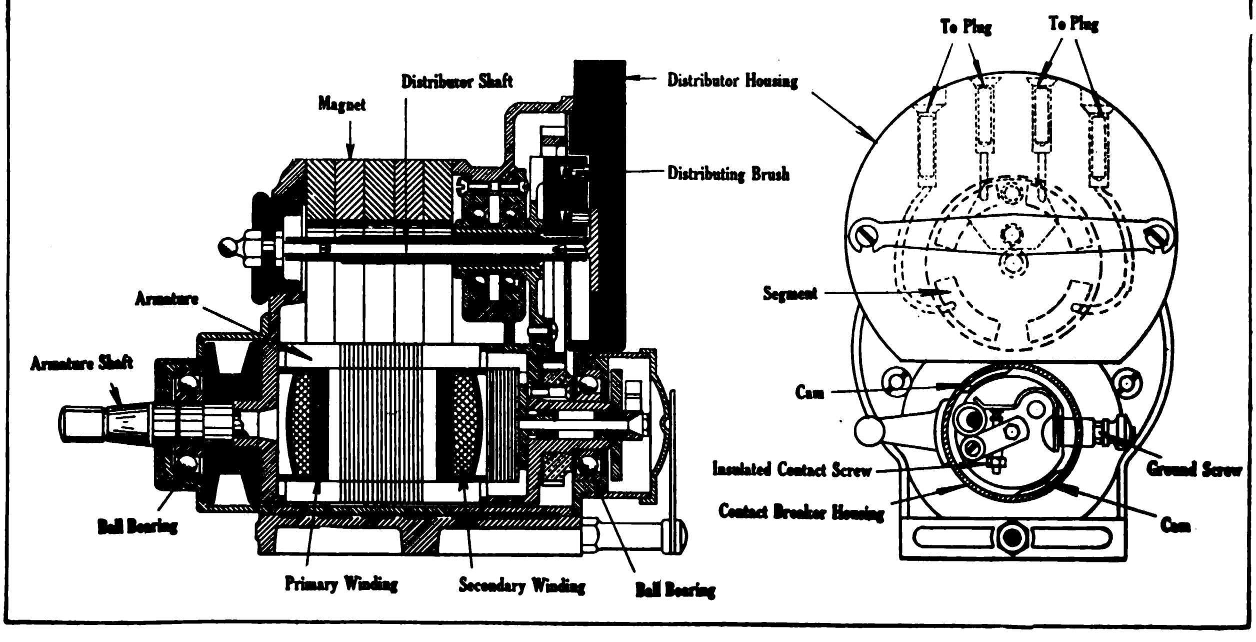


Fig. 35—Longitudinal Section and End Elevation of Herz-Ruthardt High-Tension Magneto.

The distributor member is driven through the usual gearing, and revolves on ball bearings. The current is taken from the collecting ring by a brush mounted at the side of the instrument, a removable wire spring connecting the collecting brush with the button that contacts with the bar running through the insulating bushing in the distributor shaft which delivers the high-tension energy to the revolving distributing brush selecting the segments coupled to the spark plugs in their regular firing order. There are no exposed connections except the spring clip joining the collecting ring and conductor bar that passes through the distributor shaft. The general principle involved is the same as that previously considered in connection with other similar devices.

Type C B U & H Master Magneto.

This magneto is intended for a single system of ignition, and as will be evident from longitudinal section and end elevation presented at Fig. 36, it is the same in essentials as the other instruments of the class. The generator consists of a permanent magnetic field, an armature having two windings mounted on annular ball bearings and designed to rotate between the pole pieces attached to the horseshoe magnets. A circuit breaking device, known as the interrupter is placed at one end of the armature, while the distributor serves to commutate the high-tension energy to the various plugs. In arrangement of windings and method of connection this device does not differ from the others previously described, but the construction of the contact breaker is distinctive, being composed of but few parts, made large and not liable to wear, so no adjustment is provided and it is claimed that the device is immune against any tampering, well meant or otherwise, with the adjustment of the contacts.

The interrupter consists of a bronze barrel having at one end a steel centring disc, which is recessed and which fits over the condenser housing. The grounded contact point is carried by a flexible, yielding bronze spring member that can be moved back by an interrupter arm actuated by cams fixed to the contact breaker housing. The insulated contact is carried by a disc of non-conducting material, the platinum contacts being unusually large. The principal parts of the contact breaker are shown at Fig. 37. The flexible phosphor bronze member is designated by E, the bronze barrel is marked d, the interrupter arm D, and the contact points f.

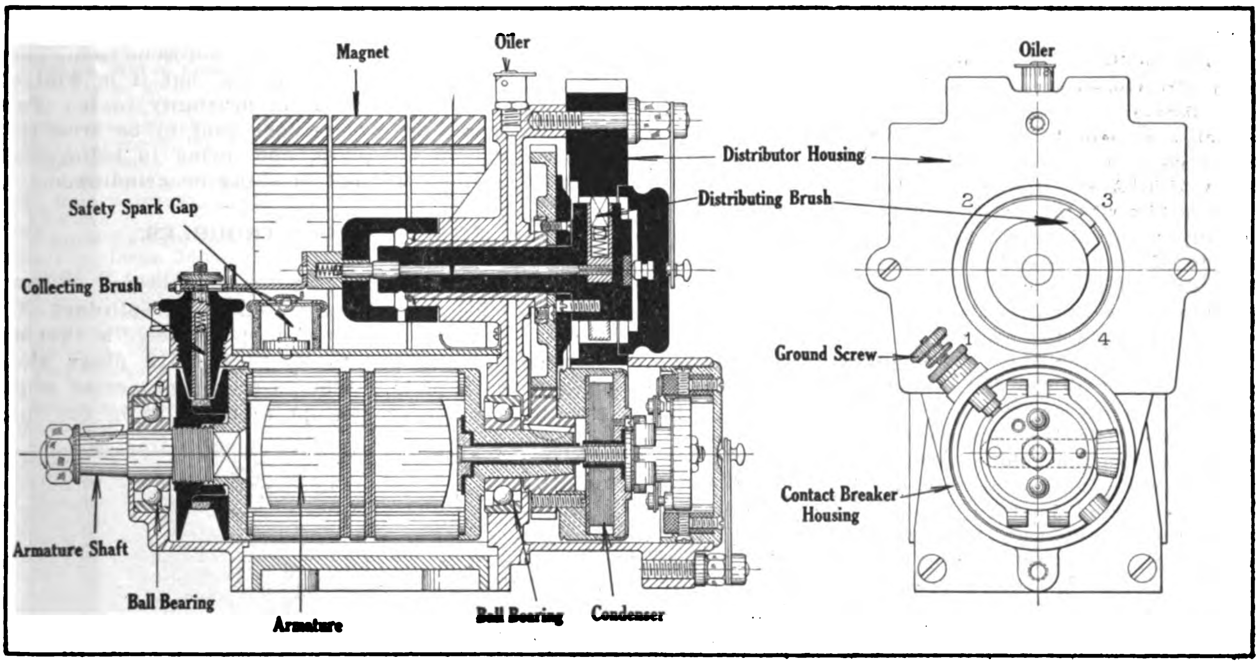


Fig. 36—Drawings Showing Arrangement of Components of U & H Master Magneto.

The various parts of the distributor and contact breaker are also clearly shown in the view of magneto at Fig. 38, in which the various parts have been removed from the assembly to show the principal elements of the two components under discussion.

In the centre of disc C is a conical hole, into which is fitted the taper binding nut G. When in position on the armature, the interrupter is held concentric by the disc e, and held firmly in place by drawing up on the binding nut G, which screws on over the stud H, and which also forms a conductor for the primary current, connecting the insulated end of the primary winding with insulated disc C. The shape of the nut G is such that it is impossible for it to ever work loose. When the short circuiting terminal I is screwed into the magneto its brush comes in contact with the insulated slip ring C-1.

The timing lever A, which fits into the end of the magneto, is arranged to be rotated 30 degrees, and thereby enables the interrupter to be operated with a corresponding range between the advanced and retarded position. The lever A is fitted with two cams J-J, spaced 180 degrees apart. The cams are of vulcanized fibre, and have broad curved surfaces, which engage with the interrupter arm D. In operation practically no wear occurs between the cams and the interrupter arm, owing both to the shape of the rubbing surfaces and the broad surfaces exposed.

How the Interrupter Works.

In the operation, the interrupter arm D comes in contact with the cams J-J, which are so set as to cause the contact points f to separate about one-sixty-fourth of an inch. This movement is made possible by the deflection of the member E, which in turn allows the arm D to rock slightly on its fulcrum F. From the above it will be seen that the bad effects of the inertia of the moving parts have been eliminated, as the flexible member E, which takes the place of the rocker arm in general use in other makes of magnetos, is under compression at all times, and is so designed as to increase its pressure in proper proportion to its deflection. As a result, the arm D follows the contour of the cams, at exceedingly high motor speeds, thereby preventing misfiring under such conditions, due to the time required by the comparatively heavy parts of other forms of interrupters to assume their normal positions after having broken the circuit, in time for the armature to "build up" for the next interruption.

Construction of Distributor Outlined.

The distributor consists of a hard rubber plate S, which is bored out to permit the distributor brush holder t to revolve within it. Arranged equi-distant around the distributor bore are brass segments, one for each cylinder of the motor. These segments connect directly with the terminal sockets in the top of the distributor plate. The segments, the faces of which are carefully machined, together with the terminal sockets and connections thereto, are all moulded integral with the distributor plate.

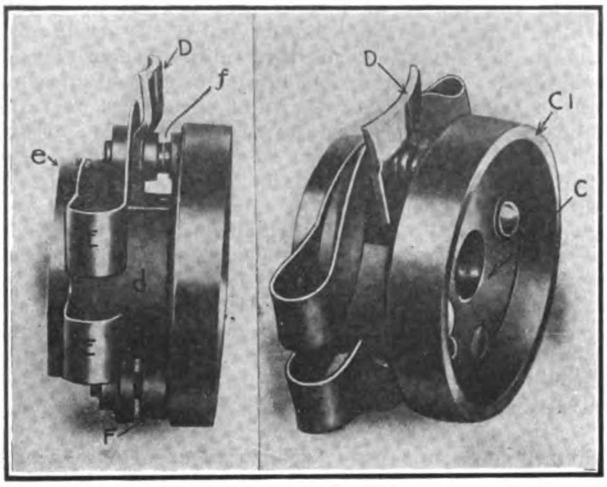


Fig. 37—Contact Breaker Used on U & H Master Magneto.

The distributor brush holder t is arranged to be readily removed from the magneto by pushing the spring clip R aside and taking off the distributor cover P. Removing this cover P exposes the distributor bore, and the brush holder t may then be pulled out of the magneto for examining the distributor brush T or cleaning the bore. The holder t is carried in a sleeve formed by the distributor bearing. Means are provided to prevent replacing the holder in any but the correct position. The sleeve which carries the holder is integral with the bronze distributor gear, which is in turn driven from a steel pinion on the armature shaft. The distributor brush always turns in the opposite direction from that of the armature.

The U & H Double Armature Magneto.

It has long been known by the engineering fraternity that the temperature of the ignition spark is not the only factor in determining engine efficiency and the power of the explosion, but that this is also largely influenced by the position and number of sparks utilized, especially in large engines. As is well known, the explosion or burning of a gas mixture occupies an appreciable amount of time, this period depending upon the rate of flame propagation of the gases burned, which in turn, depend upon their chemical composition and the degree of compression prior to ignition. To allow for this, arrangements are usually made for advancing the time of spark, hence it is agreed that if two simultaneous sparks are produced in the combustion chamber at different points, especially if the engine is a large one, much less time will elapse between ignition and complete combustion than with a single spark to kindle the compressed mixture.

Several of the manufacturers of magnetos have produced double armature forms in which two shuttles are mounted tandem on a common spindle and turn in a common magnetic field. Two distributors are employed, and two sets of contact breaking elements are provided, so that the complete instrument is virtually two magnetos in one. As the armatures and other components are driven simultaneously from the same primary source the sparks are synchronized occurring at exactly the same time. Such an instrument is valuable in races and tours because it furnishes more current and the engine is more powerful than with single ignition, and at the same time, should one part of the magneto become inoperative for any reason, the other half, which is a complete generator in itself will continue to supply current for ignition.

(To Be Continued.)

CASE HARDENING WITH KEROSENE.

Steel may be hardened by using kerosene, says a well known authority on metals. The article is rubbed thoroughly with ordinary washing soap and then placed in a charcoal fire and heated to a cherry red, after which it is plunged into the kerosene bath. There is no danger of the oil igniting, but it is well not to have any naked flame in proximity to it. Parts hardened by this process are said to be free from cracks and do not warp, and owing to being white can be finished without cleaning or grinding.

SPARK PLUG TROUBLES.

"One very good reason for the absence of spark plug trouble today," says Charles F. Splitdorf, New York City, maker of ignition specialties, "is that motorists have learned to let their spark plugs alone. The moral is plain. When a plug is suspected of giving trouble, never attempt to mend it on the road. Replace it with a fresh one and do the repairing some other time and under more favorable circumstances. The rule holds good even if the difficulty appears to be nothing more than a loss of compression, due to leaky packing."

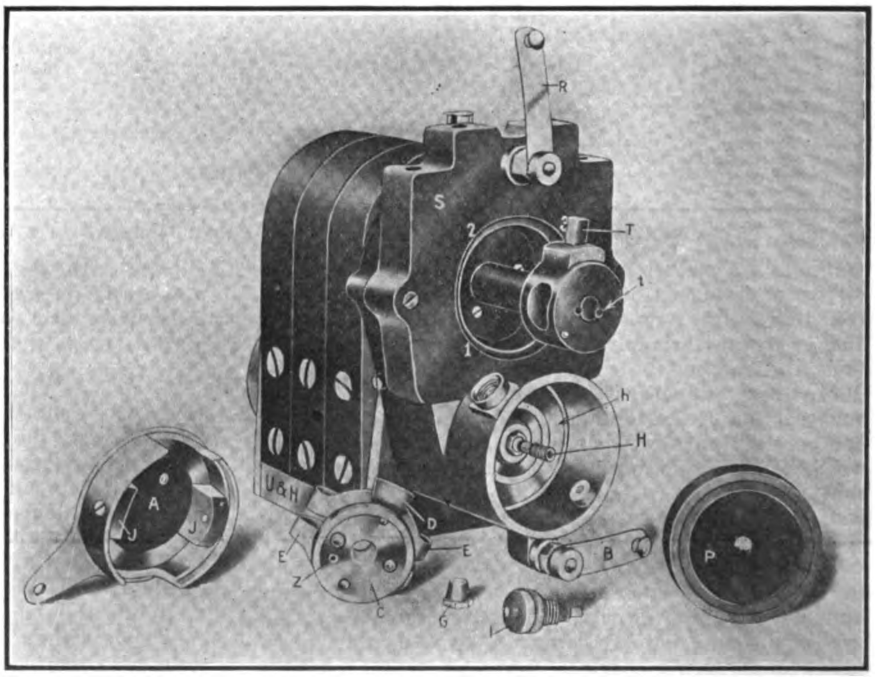


Fig. 38—U & H Master Magneto Partially Dismantled to Show Principal Parts of Contact Breaker and Distributor.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Felipse Tire and Rubber Company, New York City; $50,000; incorporators, Simon Schwartz, S. H. Silverman, H. A. Bloomberg.

Louisville Lozier Company, Louisville, Ky.; to deal in supplies; $20,000; incorporators, Howard Lothrop, H. T. Martin, Robert Stewart, D. T. Marantelle and Mary S. Lothrop.

Kadix Newark Motor Truck Company, East Orange, N. J.: $200,000; to manufacture motor trucks; incorporators, D. Lester Dann, G. F. Kallberg, Russell M. Colburn.

Hoopeston Automobile Company, Hoopeston, Ill.; automobiles and accessories; $25,000; incorporators, F. W. Wallace, J. H. Norris and W. N. Ferguson.

Byam International Autotire Company, Chicago, Ill.; to manufacture tires; incorporators, W. W. Byam, E. C. Byam, W. A. Scott.

Vixen Motor Company, Indianapolis, Ind.; $12,000; incorporators, F. C. Schmid, W. J. Harris, C. O. Van Horn, S. B. Lindley, D. K. Lindley.

Hercules Truck Company, Alexandria, Va.; $100,000; incorporators, S. W. Woodward, O. Ducker, E. S. Parker, B. W. Parker.

Oldsmobile Company of Buffalo, Buffalo, N. Y.; $10,000; incorporators, E. E. Holmes, T. S. Buckingham, J. C. Cannon.

United Garage Company, Boston, Mass.; $15,000; incorporators, Jesse Goode, J. R. Jones, W. F. Waters.

Todd & Courtney Company, Barberton, O.; $10,000; to deal in automobiles and accessories; incorporators, John H. Todd, Cora A. Todd, I. O. Courtney, Laura M. Courtney, C. C. Courtney.

Roby Carburetor Company, Indianapolis, Ind.; $10,000; to manufacture parts; incorporators, F. S. Roby, C. J. Schuh, E. D. Salisbury.

Elton Garage, Inc., Waterbury, Conn.; $25,000; incorporators, A. C. Judd, E. W. Judd, J. R. Hughes.

C. & R. Auto Company, Los Angeles, Cal.; $25,000; incorporators, Jay C. Cook, A. B. Cram, B. F. Robinson, George H. Cram, F. D. McClure.

Monticello Automobile Company, Norfolk, Va.; $15,000; incorporators, E. L. King, G. F. Bailey, E. J. Hickford.

Dual Wheel Company, New York City; wheels and truck parts; $300,000; incorporators, F. B. Cochran, Alexander Dow, C. W. Jewell.

C. E. Hall & Sons, Inc., Malden, Mass.; $5000; incorporators, A. N. Hunt, R. J. Cram, F. M. Sawtelle.

Lewis Garage Company, Boothbay Harbor, Me.; $10,000; incorporators, J. Edward Knight, E. T. Lewis, C. R. Lewis.

Unique Vulcanizing Company, Jersey City, N. J.; $50,000; incorporators, J. H. Hutten, J. P. Becker, U. C. Huber, E. R. Hussey.

Buick Sales Company, Utica, N. Y.; $5000; incorporators, George Beatty, A. D. Beatty, Emma L. Beatty, Patrick R. Ervin, H. S. Wilson.

Sceptre Motor Company, Brooklyn, N. Y.; $5000; incorporators, G. B. Ellis, William Y. Chandler, G. A. Wingate.

Isotta Fraschini Motors Company, New York City; to manufacture and deal in motors; $25,000; incorporators, G. M. Heckscher, G. N. Thurber, C. B. Jacque.

Federal Trucking Company, New York City; to manufacture and deal in motors; $25,000; incorporators, Donald B. Abbott, J. D. Fackenthal, J. I. Kauffman.

Blaisdell Automobile Company, Dexter, Me.; $25,000; incorporators, Charles R. Blaislell, F. D. Blaisdell, W. H. Judkin.

U-Nit Motor Company, Wilmington, Del.; to manufacture automobiles and motors; incorporators, Edwin C. Reed and others.

Salem Oil & Grease Company, Salem, Mass.; to manufacture oil for automobile use; $25,000; incorporators, Arthur H. Rowbotham, H. T. N. Smith, W. H. Rowbotham.

American Pneumatic Starter Company, Alexandria, Va.; $150,000; to manufacture starters; incorporators, C. A. Douglass, G. L. Parker, A. E. Leckie.

California Automobile Timetest Company, Los Angeles, Cal.; $100,000; incorporators, I. P. Carr, R. L. Bisby, E. B. Coll, Joseph H. Gosling and E. Kershner.

Great Eagle Motor Devices Company, Lindsborg, Kan.; $130,000; to manufacture and sell motor devices.

Standard Resilient Wheel Company, Inc., New York City; $500,000; incorporators, J. Gaynor, P. B. Verplanck, S. Jochelson.

D. G. Hutchcroft & Sons Company, Cleveland, O.; $10,000; incorporators, D. G. Hutchcroft, Glidden W. Hutchcroft, Thornton Hutchcroft, William Merts, S. H. Meacham.

Norman County Auto Company, Ada, Minn.; $50,000; president, Peter Matson; vice president, D. C. Lightborn; secretary, Louis Hintze; treasurer, C. J. Lofgren.

Dennis Motor Company, Toledo, O.; $25,000; incorporators, H. H. Dennis, C. W. Close, Allen E. Reid, R. S. Woodrow, John G. Meister.

Sutherland Automobile Air Appliance Company, Louisville, Ky.; $10,000; incorporators, M. M. Glavin, John W. Barns, T. R. Cartmell.

Omaha Motor Car Company, Augusta, Me.; $1,000,000; to manufacture and sell motor cars; incorporators, R. S. Buzzell, L. J. Coleman.

Chauffeurs Legal Association, Boston, Mass; $10,000; incorporators, Jay R. Benton, George A. Kearsley, Francis D. Harrigan.

Williams Auto Company, Boston, Mass.; $2500; directors, James F. Hanley, William T. Hanley, Fred W. Ryan.

Auto Tractor Company, Augusta, Me.; $100,000; incorporators, L. J. Coleman, R. S. Buzzell.

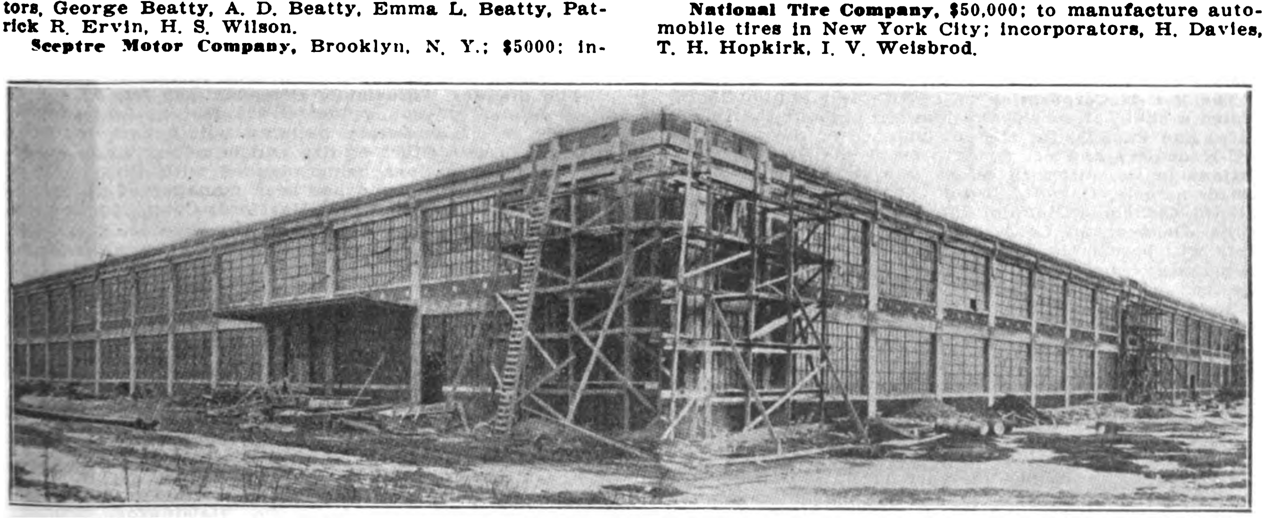
Worcester Automobile Parts Company, Worcester, Mass.; $10,000; incorporators, James N. Heald, Cyrus A. Cowan, John A. Doane.

Porto Rico Motor Company, Greenwich, Mass.; $150,000; officers, Loren J. Whiteside, Milton A. Mills.

Lyons Auto Company, Grand Forks, N. D.; $15,000; incorporators, J. W. Lyons, M. J. Lyons, M. M. Lyons.

Twin City Auto Company, Council Bluffs, Ia.; $25,000; incorporators, S. V. Barnhart, J. J. Klein, H. W. Neiman, M. C. Goodwin.

National Tire Company, $50,000; to manufacture automobile tires in New York City; incorporators, H. Davies, T. H. Hopkirk, I. V. Weisbrod.



Outer Shell of Continental Manufacturing Company's Plant in Detroit, Said to Be the Largest Institution of Its Kind in the World.

WITH THE MANUFACTURER

The Perfection Spring Company, Cleveland, O., has placed E. F. Lake in charge of its laboratory.

The Teel Manufacturing Company, Medford, Mass., which has been making the Teel truck and had announced a new one-ton machine to complete its line, has abandoned the latter project and is to handle the Federal truck instead.

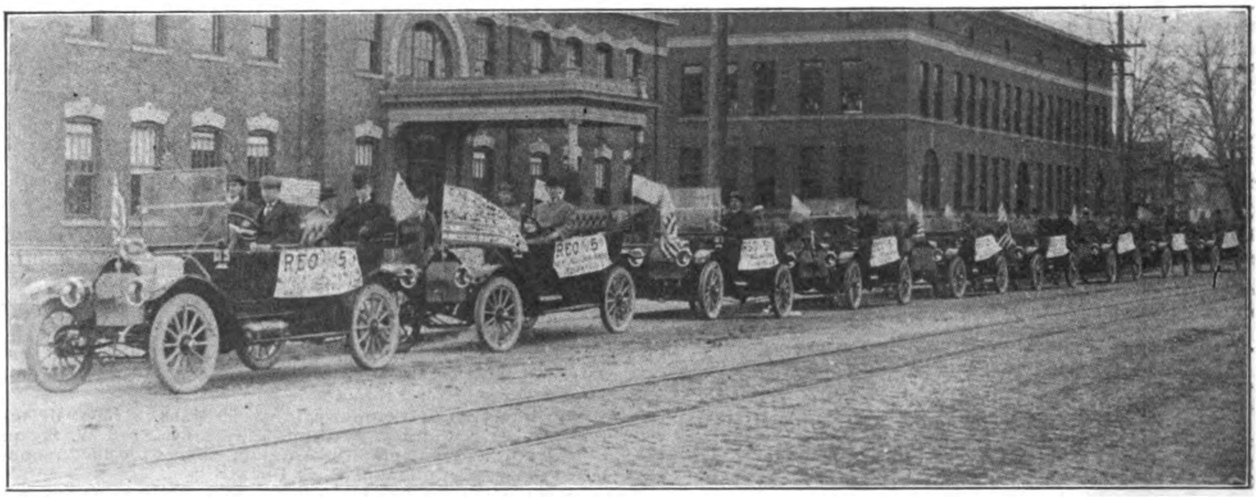
The Mather Spring Company of Toledo, O., has appointed G. H. Brown sales manager with headquarters in Detroit. Mr. Brown was formerly with the Standard Sales Company.

The Yates-Upholt Brass Company, Saginaw, Mich., has resumed operations after being idle for some two months. The output is to be taken by the Jackson-Church-Wilcox Company and the Marquette Company in Saginaw, both of which are subsidiaries of the General Motors Company.

The Ignition Starter Company, Detroit, has opened in that city a special service department for users of the Disco starter. George Waller has been placed in charge of the new department, which is located in the Dodge building. V. J. Jacobs, formerly with the Studebaker Corporation, has been added to the Disco sales force.

The Enterprise Auto Machine Works, Pontiac, Mich., has just taken possession of a new factory with modern equipment.

The Billings & Spencer Company, Hartford, Conn., has discontinued by mutual consent the selling arrangements with the Claire L. Barnes Company of Chicago, and will market its line of tools and forgings direct. The Billings & Spencer Company has more than doubled its capacity in the last two years and now has its new plant at Dividend, Conn., in full operation.



F. N. Milliman of Kalamazoo, Mich., Overcoming the Difficulties Attendant upon the Shortage of Freight Cars by Delivering Reo the Fifths over the Road.

The Harder Auto Truck Company of Chicago has secured F. J. Posta as sales manager. He was formerly with the Kissel Motor Car Company in Chicago.

The Empire Tire Company, Trenton, N. J., maker of Empire tires, is distributing a neat little cardboard score keeper to baseball fans, enabling the runs, hits and errors to be counted.

The R-C-H Corporation of Detroit is planning to establish a chain of service stations throughout the United States and Canada, for the convenience of the numerous R-C-H dealers and users. At present the plans call for stations in the cities in which a branch is now maintained; namely, Detroit, Boston, New York, Philadelphia, Atlanta, Cleveland, Buffalo, Chicago, Kansas City, Minneapolis, Denver and Los Angeles. A complete stock of parts will be carried in each station, so that it will not be necessary to send to the factory for replacements. The first of the stations is already in operation in Detroit, and is illustrated herewith. It is elaborately equipped, 124 by 60 feet, of brick and concrete construction. Other stations are to be put into operation as soon as possible.

R. M. Owen & Co. of New York recently sent four Reo the Fifths by express from the factory in Lansing, Mich., to M. A. Young, the Detroit dealer, who had secured four orders on the condition that delivery be made within 24 hours.

Charles A. Trask has resigned as chief of the engineering department of the Cartercar Company, Pontiac, Mich., and is to make a three months' trip abroad. He will study automobile engineering practise and aeronautical work in the important European centres and will conduct investigations for several motor car concerns.

Hal Smith has resigned his position as advertising manager for the Anderson Carriage Company, Detroit, and joined the advertising department of the electric truck division of the General Motors Company.

The Motor Distributing Company, Seattle, Wash., agent for the Lozier Motor Company, Detroit, is planning to spend $80,000 for a new home for the Lozier. A plot of ground has been bought for $50,000, and a $30,000 building is to be erected to house modern salesrooms and a garage and service department.

The Henry Motor Car Company's factory at Muskegon, Mich., was sold recently to E. Levens and George Fachfennaier of Philadelphia. The purchase includes all the cars and material at the factory, and it is reported that a company will be organized to supply the trade with spare parts for the Henry car.

The Olson Manufacturing Company has started work on its new factory in Sioux City, Ia., where it will manufacture valve truing and seating machinery. The factory will cost $5000, and will be 32 by 122 feet.

The Jeffrey Dewitt Company, Detroit, is building an addition to its factory which will shortly be completed. It will be two stories high, 100 by 40 feet and the increased space will enable the factory to turn out 36,000 spark plug porcelains a day, making a yearly capacity of 10,800,000. The company has bought the patents and rights to the Visible spark plug, and this will be manufactured and marketed as the J. D. Visible spark plug. It has a port or opening in the porcelain, containing an auxiliary spark gap.

The Bartholomew Automobile Company, Peoria, Ill., maker of Glide cars, has increased its capital stock to $350,000. The increase amounts to $150,000, the capital stock having been $200,000 previously.

The Krupp Motor Company, Pittsburg, Penn., has purchased 10 acres of ground near Beaver Falls, Penn., and is to start erection at once of buildings which will cost $300,000. The plans for the main building, as recently drawn up, call for a structure two stories high, 80 by 700 feet. Motors, pleasure cars and trucks will be manufactured, and about 200 men will be employed at first.

Hess & Son, Philadelphia, has moved to new and larger quarters at 666 North Broad street, where Tinol, the combined solder and flux, will be carried in stock.

The Simplex Automobile Company has leased for 15 years a plot of ground 100 by 200 feet in Long Island City, N. Y. A one-story building will be erected at a cost of $40,000. Other stories will be added when necessary, the foundations being planned with this in view.

Fred E. Bogart, who has been manager of the Hartford Auto Parts Company, Hartford, Conn., for several years, has retired.

George Weber has been appointed factory manager for the Metzger Motor Car Company, Detroit, and will look after the manufacture of Everitt cars. Mr. Weber is a man of considerable experience in the manufacturing end of the industry, having been with the Locomobile Company of America, Bridgeport, Conn.; the Waltham Manufacturing Company, Waltham, Mass., and the Buick Motor Company, Flint. Mich.

William C. Little has resigned his position with the General Motor Car Company, Philadelphia, and accepted the position of western travelling representative for the Lozier Motor Company, Detroit, representing the Lozier in the Missouri river and Rocky mountain territory.

The Metzger Motor Car Company, Detroit, has closed a deal with George Holm & Co., Helsingfors, Finland, giving it the agency for the Everitt cars in Finland and the northern part of Russia.

UNI[illegible] CALIF[illegible]

Dyneto Electric Company is to move its plant from Elbridge, N. Y., to Syracuse, and negotiations are under way for obtaining a suitable factory.

The Abbott Motor Company, Detroit, recently closed Abbott-Detroit agency contracts with the following: Victor Levesque, Montreal, Can.; Norwood Machine Company, Norwood, O.; Western Motor Car Company, Denver, Col.; R. J. Rhodes, Newport News, Va.; Reese Machine & Tool Works, Plymouth, Penn; Zanesville Taxicab Company, Zanesville, O.

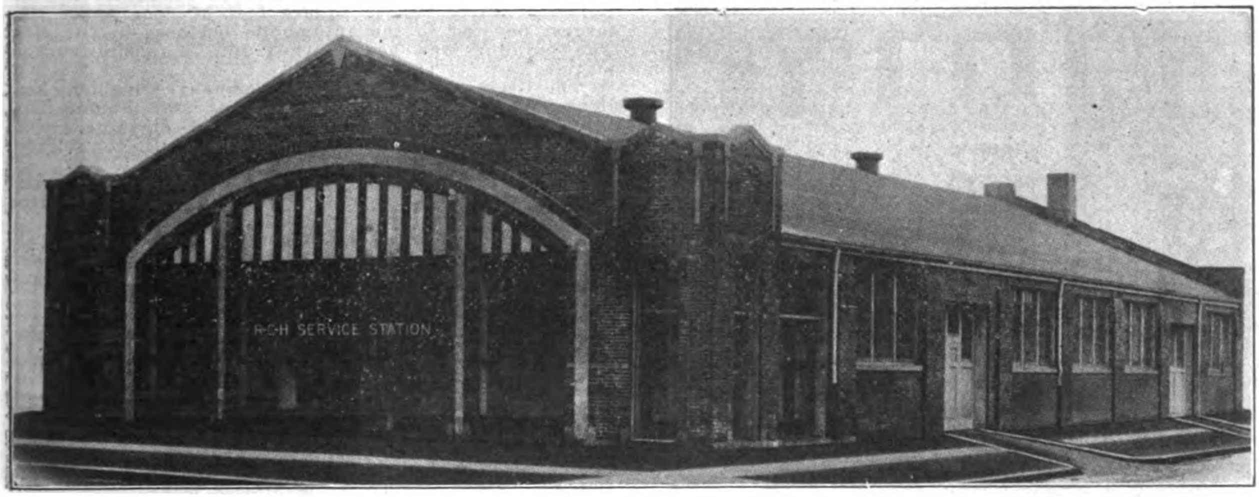
The Pittsburg Chalmers Company, Pittsburg, Penn.; has bought a plot of land in Louisa street, where a $20,000 building, containing display, sales and repair rooms, will be erected.

Hopkins, Botto & Hocke, New York City, agent for the Abbott-Detroit, made by the Abbott-Detroit Motor Company, Detroit, has moved the Regal cars, made by the Regal Motor Car Company, Detroit, into new quarters at 1668 Broadway. An increase of business required housing these machines separately.

The Heald Machine Company, Worcester, Mass., maker of grinding machines, is issuing to the trade, a neat booklet entitled "Oversized Standards for Pistons and Rings," being a reprint of a paper presented at a meeting of the Society of Automobile Engineers. The booklet is illustrated and teems with interesting features.

E. P. Chalfont, who has been at the head of the E. R. Thomas Motor Car Company of Buffalo, N. Y., since its reorganization, resigned recently to become associated with Harrison Williams of New York City, financier and director of public utility corporations. Mr. Chalfont will remain a stockholder in the Thomas company.

The Nyberg Automobile Company, Chattanooga, Tenn., will begin the extensive manufacture of the Nyberg car in the near future. A building has been leased for a factory and is being equipped with machinery. Several models will be constructed including a commercial vehicle.



New Service Station Recently Opened in Detroit by the R-C-H Corporation, the Forerunner of Others to Be Established in Several Cities.

The Ford Motor Company, Detroit, will establish a branch factory in Los Angeles, Cal., so soon as a suitable location can be found. The factory will cost about $300,000 and will employ about 800 men. The new plant is intended to supply all Ford cars used in Arizona, Nevada, Utah, California and Japan. The dimensions will be 150 by 500 feet and four stories in height. Electricity will be employed for power.

The Krupps Motor Company, Pittsburg, Penn., will erect a new plant either at Ambridge or Beaver Falls, Penn., and the buildings will be of reinforced concrete. The plans call for five structures, these ranging from two to five stories.

The Croxton Motor Company, Cleveland, O., held its annual meeting recently at which the following officers were elected: President, H. A. Croxton; vice president, Charles Stevens; secretary, O. A. Peters; treasurer, I. Zimmer; directors, J. P. Stoltz, John Stoltz, O. A. Peters, Charles S. Patterson.

The Frontier Tire & Rubber Company, Buffalo, N. Y., which was organized to take over the business of the Frontier Rubber Company of that city, plans the extension of the business. The concern proposes to manufacture about 2000 tires a day and in addition will make mechanical rubber goods. A large number of workmen will be employed.

The Simplex Motor Car Company, Mishawaka, Ind., maker of the Amplex car, announces the opening of a salesroom and repair shop at 853 Carondelet street, New Orleans, La. W. Durand will have charge.

F. R. Humpage, Detroit, who has been with the E. R. Thomas Motor Company, Buffalo, N. Y., for about a year, has been elected president to succeed E. P. Chalfont, who resigned recently. W. L. Gleason becomes vice president, and J. R. Ramsey continues as secretary and treasurer.

The Briggs-Detroiter Company, Detroit, maker of the Detroiter, is now occupying its new factory of reinforced concrete at 475 Holbrook avenue, in that city. The structure is 250 feet long and 100 feet wide, and is equipped to produce 1000 cars before July 1. The foundation is being laid for another building to adjoin the present factory.

The Bellamore Armored Car & Equipment Company, Bridgeport, Conn., has purchased the business and plant of the Bridgeport Vehicle Company of that city and will continue to manufacture bodies and accessories. The general office will be located at 286 Fifth avenue, New York City.

The H. W. Johns-Manville Company, New York City, manufacturer of asbestos products, etc., states that the increasing demand for its product in Pittsburg, Penn., and vicinity, has necessitated a move to larger quarters. The branch is now occupying the entire eight-story stone, reinforced concrete and steel building at the northeast corner of Wood street and First avenue, which has been leased for a term of years. The structure provides a floor space of 23,808 square feet.

The Havers Motor Car Company, Port Huron, Mich., announces the appointment of the following new agencies: R. H. Ives & Co., Binghamton, N. Y.; E. T. Wood Company, Worcester, Mass.; George McCutcheon, Butte, Mont.; B. A. & R. Cunningham, Hackensack, N. J.; R. H. & H. C. Gray, Seattle, Wash.; L. P. Strayer, Rock Island, Ill.; M. T. Dill, New Haven, Conn.

The Velie Boston branch announces the following new agencies and reappointments for pleasure and commercial cars made by the Velie Motor Vehicle Company, Moline, Ill.: R. J. Flynn, Hartford, Conn.; J. A. Alderman, Suffield, Conn.; Tucker & Palmer, Tariffville, Conn.; Homer H. Judd, Bristol, Conn.; Walter B. Johnson, Essex Junction, Vt.; H. C. Purves, St. Stephen, N. B.; Shean Auto Station, Boston, for Springfield, Mass., and surrounding towns. The following agencies have been closed by the Velie Chicago branch: Moran Auto Sales Company, Grand Rapids, Mich.; J. F. Charley Auto Company, Evansville, Ind. All agencies will maintain the service station policy of the company.

The Iroquois Top Company, Utica, N. Y., recently elected the following directors: F. W. Dygert, Patrick A. Gormican and Fred Widme.

R. S. de Mitkiewicz has resigned as sales manager of the Motor Engineering & Sales Company of New York City to accept a position in the truck department of the Peerless Motor Car Company of New York.

Arthur G. Beharrell has closed with the Velie Boston branch for the sale of Velie cars in Lowell, Mass., for the fourth year. He will establish a service station.

The Peerless Motor Car Company of New England, agent for the well known pleasure vehicle of that name, announces the opening of a branch and service station at 773 Broad street, Providence, R. I., which will be in charge of J. W. Breese, a factory representative.

Earl Chambers, who has been handling Velie cars for the past three years in Danville, Ill., has accepted a position with the Chicago branch of the Velie Motor Vehicle Company, Moline, Ill.

The C. W. Bowles Automobile Company, Evansville, Ind., is seeking a new location having outgrown its present quarters.

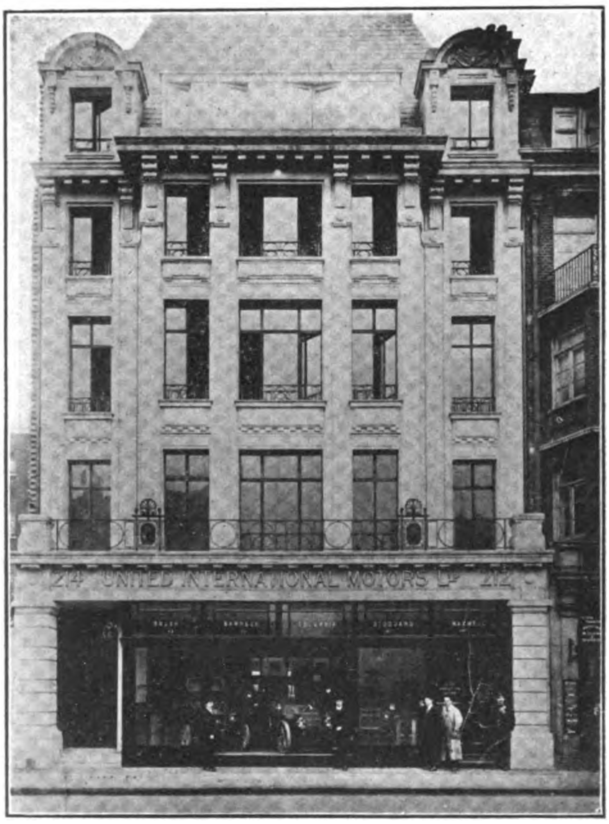
The Garland Automobile Company, distributor of the Velie and Speedwell in New York City, has moved to 1888 Broadway, taking the salesrooms formerly occupied by the Corbin agency.

C. C. Hinkley has joined the Chalmers Motor Company, Detroit, as chief engineer, having left the Covert Motor Vehicle Company, Lockport, N. Y. He has had considerable experience in the automobile industry having been with the Olds Motor Works and the Owen Motor Car Company.

The Continental Motor Manufacturing Company, Detroit, has erected what is claimed to be the largest factory building in the world devoted to the manufacture of motors for automobiles. It is located near the plant of the Hudson Motor Car Company, and cost approximately $1,000,000. The capacity of the company, which has been given as 18,000 motors annually, is to be doubled when the new structure is in full operation. The total floor space is 240,000 square feet, the building covering 12 acres. The present plant at Muskegon, Mich., is to be continued in addition to the new one at Detroit.

The Goodyear Tire & Rubber Company, Akron, O., has placed the Cleveland and Toledo, O., branches in charge of the Detroit manager, E. F. Jackson, who also has charge of the branch in Grand Rapids, Mich. C. W. Holcker has been made local manager of the Detroit establishment.

A. R. Mosler & Co., has moved to new quarters at Webster and Wakefield avenues, Yonkers, N. Y., where a new factory and office buildings give more space and greater facilities. The factory is in a pleasant environment and is equipped with the most modern machinery.



Five-Story Building in London Occupied by the International Motors, Ltd., the European Branch of the United States Motor Company.

The F-S Motors Company, Milwaukee, Wis., is manufacturing the F-S light delivery car in its large auxiliary plant at First and Oklahoma avenues, using Beaver motors and Weston-Mott rear axles.

The Goodyear Tire & Rubber Company, Akron, O., has made a number of changes in its sales organizations, as follows: William M. Boggs, formerly at Philadelphia, is now in charge of New Jersey territory; H. G. Bruning is taking care of motor truck sales in Cleveland, O.; F. H. Findlay has been transferred from the New York branch to Brooklyn with J. B. Linerd, who will travel from Brooklyn for solid tires; H. B. Morton, Chicago, has been placed in charge of Illinois territory in place of H. L. Lawson, with R. H. Campbell succeeding him in Chicago. New salesmen have been appointed as follows: H. W. Hoklas, Minneapolis; D. H. Cottrell, Buffalo; R. S. Grant, Cleveland; I. S. Roberts, eastern Missouri.

The Hyatt Roller Bearing Company, Detroit, has issued in booklet form reproductions of its advertisements, and is distributing the booklets to the sales and advertising managers of automobile concerns handling cars equipped with Hyatt roller bearings, in order to furnish them with selling arguments.

The United States Motor Company has taken new European headquarters in London at 212-14 Great Portland street. A five-story building has been secured and is occupied by the United International Motors, Ltd., as the foreign affiliation of the American concern is called.

D. F. Poyer & Co., maker of Menominee trucks in Menominee, Mich., has purchased the Gram factory buildings, the present facilities being too small. During 1912 a total of 300 cars is to be made.

The Kilgore Manufacturing Company, Boston, has moved into larger offices at 883 Boylston street. The Air shock absorber which the company manufactures has been improved, and may be had in a number of finishes to match any car, and in large sizes for trucks, as well.

The Hartford Suspension Company, Jersey City, N. J., is shortly to place on the market a new spark plug. No details of the plug have been made public, but it is stated that it will be of the two-piece type.

The Ross Gear & Tool Company, making truck steering gears in Lafayette, Ind., is to erect a new factory on North Eighth street, which will give it 50,000 square feet of floor space.

The East Aurora Motor Car Company has been organized in East Aurora, N. Y., with a capital of $8000 by A. L. Pierce, M. B. Paxon and Winfield S. Wilson. It is stated that automobiles will be manufactured.

H. A. Worman, formerly with the National Carbon Company, Cleveland, O., as advertising manager, has joined the Baker Motor Vehicle Company in the same city and taken charge of the advertising department.

The Fisk Rubber Company, Chicopee Falls, Mass., has opened a new Pacific Coast headquarters in San Francisco, on Van Ness avenue. The building is two stories high, of reinforced concrete, and contains, besides the salesrooms and offices, a complete service department for repairs and vulcanizing.

The Kissel Motor Car Company, Hartford, Wis., has leased a large four-story building at the corner of 26th and Wabash avenue, Chicago, and now occupies in that building nearly 100,000 square feet of floor space, the largest devoted to the automobile business in the city. The building has been turned into a model service station.

The Great American Rubber Company, Conshohocken, Penn., has appointed the following agents: Seldom Motor Car Company, Houston, Tex.; E. S. Sporting Goods & Auto Supply Company, Athens, Ga.; J. B. McClelland, Sault Ste. Marie, Mich.

The Mack Bros. Motor Car Company, Allentown, Penn., has purchased six acres of ground adjoining the plant and will erect an addition.

The Miller Carburetor Company of Los Angeles, Cal., has decided to move to the Middle West, and has taken temporary quarters in Indianapolis, where the company will be closer to the industry.

GARAGE & DEALER

The Omaha Branch of the Studebaker Corporation at Omaha, Neb., is to give up the retail end of the business and devote its energies to wholesale work. The retail sales of Flanders and E-M-F cars have been taken by the E. E. Wilson Company, and both companies will occupy the same quarters as before.

The Austin Tire & Rubber Company has opened a salesroom in Salt Lake City, Utah, at 147 East First street, South.

The Buick Garage in Northampton, Mass., is being enlarged. Among the improvements is to be an electric elevator.

The Baker Bros. Motor Company, the Buffalo, N. Y., agent for the Cole, expects to be in new quarters in the near future. The new building at 1024-26 Main street will have a salesroom, storage room and service department, and is already under construction.

The Collingwood Sales Company has been organized in Toledo, O., by M. E. Humbarger and Samuel Hoover. A garage will be operated and Apperson cars will be handled in the territory including northwestern Ohio.

D. M. Beal, manager of the Moline agency in Omaha, Neb., has taken temporary quarters at 2129 Farnam street while his new garage is being built.

H. R. Pfeiffer of York, Penn., who has the agency for the Baker electric in York, Lancaster and Adams counties, has added Dauphin county to his territory and opened a garage in Harrisburg.

The Robert F. Boda Automobile Company, Columbus, O., has doubled the space of its salesroom by leasing an adjoining storeroom.

The Everitt Sales Company has succeeded the Georgia Motor Car Company at Atlanta, Ga., which handled the Everitt, Brush and National lines. The new concern is practically a factory branch, and for the present continues to occupy the Georgia company's place at 33 Auburn avenue.

W. O. Durrant, Niagara Falls, N. Y., has purchased the Prospect garage and is having it remodelled.

The True & Blanchard Company, Newport, Vt., is building a large fireproof garage on Main street and Northern avenue, with approaches from both streets.

The Boston Automobile Clearing House has been started in Cambridge, Mass., by R. I. Kendall. Second hand cars will be handled at 55 Franklin street.

The Salt Lake Automobile Company has opened new quarters in Salt Lake City, Utah, at 162 East First street, South.

Frank S. Parsons is to conduct a garage in Northampton, Mass., ground having been broken for a structure capable of housing 35 cars on the first floor.

White & Durgin is to erect a large fireproof garage in Haverhill, Mass., plans having been approved.

Edward J. Gallien, Jr., has been appointed assistant to the president, and auditor of the Pierce-Arrow Motor Car Company, Buffalo, N. Y., maker of Pierce-Arrow cars.

Jesse Froelich, formerly with the Benz Auto Import Company of America, has joined the Times Square Automobile Company, New York City, and has also taken the agency for Imperial tires for New York, Connecticut, Long Island and northern New Jersey for the McGraw Tire & Rubber Company, East Palestine, O.

The Cole Motor Car Company, Indianapolis, Ind., has appointed new agents as follows: Meade McClachy, Canton, Ill.; J. C. Reeter, Lake City, Ill.; B. H. Kamp Auto Company, Mt. Carmel, Ill.; E. McMullen, Muncie, Ind.; Charlotte Auto Company, Charlotte, Ia.; Fairchild Auto Company, New Orleans, La.; F. L. Preston, Athens, O.; Norris & Cowls, Washington, D. C.; C. L. Culton, Edgertown, Wis.

A. D. Frost has been appointed manager of the New York branch of the American Locomotive Company, recently established.

The Gewinner Company, Atlanta, Ga., has moved into new quarters at the corner of Harris and Peachtree streets, occupying two floors of a new building which was recently erected.

The Patterson Automobile Company, Hamilton, Can., recently moved into a new garage at 680 King street. The establishment has storage room for 20 cars, and a complete repair department and machine shop.

The Magna Bros. Automobile Company, Holyoke, Mass., is to occupy the whole of the building in which its garage is located, at the corner of Division and Railroad streets. The second floor is to be taken over and used partly as a showroom and partly for storage.

The Gessler Williams Tire Company, Denver, Col., has taken the agency for the Swinehart tire, made by the Swinehart Tire & Rubber Company, Akron, O.

Mueller Bros., Pittsburg, Penn., representative for the Alco, has taken the agency for the Haynes, J. A. Stranahan, former representative of the Haynes having joined the Muellers.

New agents for the Adams trucks, made by the Adams Bros. Company, Findlay, O., have been appointed as follows: Electric Service & Repair Company, Duluth, Minn.; Central Automobile Company, Albany, N. Y.; Hoagland-Thayer, Inc., Newark, N. J.; L. G. Schoepflin Company, Buffalo, N. Y.; Milton G. Smith Auto Company, South Bend, Ind.; Commercial Auto & Repair Company, San Antonio, Tex.; Waco Auto Company, Waco, Tex.

The Standard Motor Car Company, Dayton, O., has secured the agency for Lippard-Stewart trucks in Dayton and adjacent territory. The concern also handles the Hudson pleasure line.

The American Locomotive Company, New York City, has appointed new agents as follows: Highland Garage Company, Birmingham, Ala.; Advance Auto & Machine Company, Evansville, Ind.; Dubuque Rambler Auto & Supply Company, Dubuque, Ia.; Lawrence M. Connell, Scranton, Penn.; Walter K. Patterson, Portsmouth, O., and N. E. Holden, Danville, Ill.

H. G. Raymond, Fort Wayne, Ind., agent for the Imperial and R-C-H, is having a new garage built at 718 Barr street. The building will contain 7680 feet of floor space, and will cost $12,000.

F. N. Milliman, Kalamazoo, Mich., agent for Reo cars, made by the Reo Motor Car Company, Lansing, Mich., recently overcame the difficulty attendant upon the freight car shortage by taking 12 Reo the Fifths over the road from the factory to his salesroom, the cars negotiating deep sand and mud without trouble.

The Murray O'Neill Company, New Bedford, Mass., recently opened new quarters patterned after the most approved metropolitan style. The garage is provided with supply, repair and paint rooms, while a waiting room caters to the comfort of the patrons.

Superior Motor & Machine Company, Superior, Wis., has leased the Cary garage building on Tower avenue and will operate it in connection with the other garages of the concern. This move was made necessary by the rapid expansion of the business.

The Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, opened a new factory branch in San Francisco, Cal., recently. The new quarters are large, 50 by 150 feet, and the equipment of the branch is exceptionally complete.

Malcolm P. Burbank, 805 Main street, Worcester, Mass., has taken the local agency for Pullman cars, made by the Pullman Motor Car Company, York, Penn.

The Studebaker Automobile Company, Milwaukee, Wis., has moved into new quarters in the Stroh building, where a service department will be maintained in addition to show rooms for the E-M-F and Flanders. C. R. Dashiell, formerly local manager, has gone to the Chicago branch, and has been succeeded by L. P. Chittenden, who has been travelling in Wisconsin for the Studebaker organization.

J. William O'Donnell, Jr., Lynn, Mass., has been appointed agent for the Morgan Motor Company, Worcester, Mass., and will handle Morgan trucks in Lynn. He is but 19 years old, and will be placed in charge of the only truck service station in the vicinity.

Dewey & Byrns, conducting the Island garage in Potsdam, N. Y., has just installed an 18-foot elevator, making the garage one of the most complete and up-to-date in the locality.

The Oklahoma Motor Car Company, Oklahoma City, Okla., has taken the agency for the R-C-H, made by the R-C-H Corporation, Detroit, and is carrying a full line of cars.

The City Hall Garage, Lowell, Mass., has been bought by J. C. Evans and Carl W. Morteson of North Billerica, Arthur Beharrell, the former proprietor, having gone to the Boston office of the Velie.

The Cook & Stoddard Company, Washington, D. C., will remove into new quarters at 1138 Connecticut avenue, N. W., in the near future. The company handles Cadillac, Pierce-Arrow and Baker electric cars.

The R-C-H Motor Sales Company, Jackson, Mich., incorporated some time ago by F. C. and G. A. Weber, has opened salesrooms for the R-C-H cars at 304 Cooper street.

Ramsey's Auto Supply House was recently opened in Phoenix, Ariz., by J. R. Ramsey, representing the Western Rubber Supply Company of Los Angeles, Cal. A full line of automobile supplies will be carried, and a specialty will be made of vulcanizing.

Geo. R. Giroux has become manager of the Foraker Motor Truck Company, Chicago, Ill., handling Durable Dayton trucks, made by the Dayton Motor Truck Company, Dayton, O. Mr. Giroux formerly handled the Little Giant, produced by the Chicago Pneumatic Tool Company.

Fred F. Folger, Watertown, N. Y., has purchased the garage of the Warner Automobile Company, and will succeed Mr. Warner, who, however, still retains the agency for Ford cars, made by the Ford Motor Company, Detroit. The garage has been improved and its equipment brought up-to-date.

The Selden Motor Car Company is to erect a $50,000 garage in Houston, Tex., on Clay avenue. The building will be three stories in height, thoroughly modern and strictly fire proof.

The Goodyear Tire & Rubber Company's branch at Portland, Me., has moved to 646 Congress street. I. W. Penniman of the Boston branch has been appointed local manager.

W. R. Campbell, who recently purchased the West machine shop in Evart, Mich., is having it torn down and is to erect a modern concrete garage. Several men will be employed, and the establishment is expected to be completed in time to care for the summer tourists.

Harry Baker of Cleveland, O., has become manager of the E. Stewart Automobile Company, San Francisco, handling S. G. V., Marquette and Crawford cars in northern California.

Tri-City Auto Supply Company recently opened in Rock Island, Ill., at 319 Nineteenth street. The company is the only exclusive supply house in the locality, and carries a full line of accessories.

Kiel & Evans, Oakland, Cal., has taken the agency for the Commerce truck, made by the Commerce Motor Car Company, Buffalo, N. Y.

The American Auto Company is the latest automobile concern to open in Davenport, Ia., handling the American underslung at 211 East Second street. Salesrooms and a garage have been opened.

Paul R. Pelz has taken hold of the management of the Benz Auto Import Company, filling the vacancy left by the resignation of Jesse Froelich, who still retains his interest in the company.

F. W. Johnson is to open a new garage in Fulda, Minn.

Stafford Noble has bought the St. Mary's Auto Garage, St. Mary's, O., from August Schierenbeck.

Dittrich Bros., Perth, Ont., has just completed a new garage, which it will operate in addition to its foundry and machine shop.

The Eastern Auto & Machine Company, Baltimore, Md., has awarded the contract for the erection of a garage on the Philadelphia road, on the outskirts of the city. The building will be 180 by 49 feet, of brick.

The Orland Garage, Orland, Cal., has been purchased by Thomas and Roscoe Scribner.

Bunn & Goembel is a new firm that has opened a garage in Pipestone, Minn.

The Twyman Motor Car Company, Columbus, O., agent for the E-M-F and Flanders, has opened a branch in Dayton, O., at 224 North Main street. This will enable the company to handle the local Dayton business to a better advantage than formerly, and also give improved service to the dealers in Montgomery and surrounding counties.

H. R. Polk, Des Moines, Ia., has purchased the automobile business of the Cunningham Automobile Company from William R. Cunningham and will hereafter conduct it under the name of the Central Iowa Motors Company, handling American and Hupmobile cars for the state.

The Hub City Vulcanizing Works has been established in Sheboygan, Wis., by George N. Putnam and M. Bachanz.

William R. Cunningham, who sold the American Automobile Company, Des Moines, Ia., to H. R. Polk, is to establish a second hand car business under the name of the Western Automobile Clearing House, in connection with which he will operate a garage and repair shop.

The Sterling Motor Car Company, Indianapolis, Ind., has moved into new quarters at 320-322 North Delaware street, where it is better able to display its line of Paige-Detroit and Firestone-Columbus cars. The change was made necessary by the rapidly increasing business of the company

W. S. Sanderman, known as "Sandy" to his many friends in and around Boston, has started in business again, having opened a garage at 59 Boylston street, Cambridge, near Harvard square.

The Knickerbocker Motor Car Sales Company, which was recently organized with W. M. Botto, formerly of the Abbott-Detroit Motor Company of New York, as general manager, is handling the Havers Six-44 in one of New York's finest salesrooms, in the Winter Garden building. The company is the sole distributor for the Havers cars for eastern New York and Fairfield county, Conn.

The Alexandria Garage has been opened in Amityville, N. Y., by Richard G. Evento, at Bayview avenue and South County road.

Charles Chance, Eastport, Me., has purchased some water front property and intends to remodel it into a garage which he will conduct in connection with his launch business.

Benjamin Ward, Brockton, Mass., has expanded his repair shop on Clinton avenue by the addition of a complete welding and brazing equipment.

G. W. Jocelyn has purchased the tire repair shop of J. A. Peltier & Sons, 471 High street, Holyoke, Mass., and is conducting it in conjunction with his bicycle business.

Charles E. Ball is the latest addition to the automobile supply houses of Newark, N. J., having opened a store at 351 Halsey street.

A. B. Craven, Kellogg, Ia., is to handle the Maxwell and Case cars, and is building an addition to the Holdsworth Wagon Shop in which he will house the two lines.

Floyd Ellet, Mediapolis, Ia., has opened a garage and repair shop and is carrying a line of supplies, as well as operating a vulcanizing plant. He is located in the building formerly occupied by Johnson's livery stable.

The Atchison Motor Company, Atchison, Kan., has been formed by E. J. Donnelly and W. Y. Alkire, and has just taken possession of a modern garage at Ninth and Commercial streets.

Claude Younger, Louisville, Ky., has taken the agency for the E-M-F and Flanders. A salesroom and office have been secured at 916 South Third street.

John H. Duffy has opened an establishment in New Orleans, La., where he is conducting a general automobile sales and repair business.

The International Motor Company, Baltimore, Md., is installing its equipment in the new five-story building at 30 South Hanover street, and will soon be ready for business.

Joseph B. Johnson, Tampa, Fla., has taken possession of the new garage and repair shop which he had built, and is now ready for business.

The Dale Taxicab Service, the first taxicab operator in Des Moines, Ia., has opened a new garage and has its fleet of machines in full operation.

The Chapman-Love Auto Company, Washington, D. C., agent for the King car, has secured permanent quarters at 1312 14th street, N. W.

D. H. Sloan & Son, Lakeland, Fla., has taken the agency for Penn, Case and Maxwell cars, and has opened a salesroom in the Peacock building.

E. E. Barry, Washington, D. C., is remodelling his granary at 13th and W streets into a garage. An electric elevator is to be installed, and the building will be equipped with the most modern improvements.

T. L. Jackson, the Washington, D. C., agent for Stevens-Duryea cars, has moved into new quarters at 14th and R streets.

F. L. Butman of Glendale, Cal., has moved to Pomona and opened an agency for the Metz car at 145 East Pearl street.

E. J. Montgomery, the Brooklyn, N. Y., agent for the Stutz, has moved his establishment, including the salesroom and service department, to 1289 Bedford avenue.

T. Earl Allaman, 4268 Olive street, St Louis, Mo, has been appointed manager of the Federal Tire Agency which was recently established in St Louis to succeed the Petty Tire & Rubber Company, the former agent for Federal tires.

The Vestal Motor Car Company, Pittsburg, Penn., has moved to new quarters at 5852-54 Baum street The new structure is large and will furnish space enough to take care of the company's needs for some time to come. Stevens-Duryea and Velie cars are handled.

A. J. Rogers of the sales department of the Remy Electric Company, Anderson, Ind., has gone to San Francisco to take charge of the branch there at 170 Golden Gate avenue. He is well known in the South and West, and will no doubt repeat his success in that territory.

LeHardy & Lindsay, Rochester, N. Y., agent for the Marmon, made by the Nordyke & Marmon Company, Indianapolis, have contracted for the property at 308-10 East avenue. The building will be altered and a show room and garage built.

R. B. Raynor, Fort Wayne, Ind., has secured the agency for the Cutting car, made by the Clarke-Carter Automobile Company, Jackson, Mich., and will operate under the firm name of the Cutting Sales Company, conducting a garage as well as salesrooms.

George Yoa, Syracuse, N. Y., agent for the Abbott-Detroit, made by the Abbott Motor Company, Detroit, recently moved into a new garage at 1057 South Clinton street. The building is 40 by 110 feet, two stories high.

The Trenton Motor Car Company, Trenton, N. J., composed of Hugo Ufert and Oliver O. Moore, recently purchased Dorsett's Electric garage, at 111-113 Chancery street. Extensive alterations have been made, and the new concern carries a full line of parts and accessories.

The New England Auto & Supply Exchange, Bridgeport, Conn., has been organized by George W. Jackman, and a salesroom opened at 608 Main street, where a full line of supplies is carried.

The Pullman Motor Car Company, York, Penn., has opened salesrooms in Pittsburg, on South Highland avenue. The Auditorium building is to be remodeled at a cost of about $40,000 and will be used by the branch, which will be incorporated as the Pullman Auto Company of Pittsburg.

The Neustadt Automobile & Supply Company, St. Louis, Mo., has secured as department managers, Earl J. Hoffman, formerly with the Timken Roller Bearing Company, and Robert W. Maloney, an expert on automobile lighting.

The Dwyer & Roche Company, Hartford, Conn., has taken the livery stable at 18 John street and is conducting an automobile painting and repair business. The building is centrally located, and contains 15,000 square feet of floor space.

C. E. Havens has been appointed manager of the service and technical departments of the Abbott Motor Company, Detroit, having left the Hudson Motor Car Company. Mr. Havens has had considerable experience in the factories, having been connected with the Thomas and Oldsmobile plants.

The Repass Automobile Company, Waterloo, Ia., a branch of the Herring Motor Car Company, Des Moines, has moved to new quarters, 217-19 West Fifth street, where they have ample room to display Ford cars, and to conduct a repair and service department. A total of 50,000 square feet of floor space is occupied by the company.

The Highland Garage, Birmingham, Ala., has leased the building formerly occupied by Drennen & Co., and will convert it into a show room. This concern also purchased a garage located at Five Points recently.

A. E. Hunter, well known to the automobile men in northern California, has taken the agency of the Firestone-Columbus, made by the Columbus Buggy Company, Columbus, O., for San Francisco, Cal., and will carry a full line including the electric automobile.

The Howard Company, New Haven, Conn., is to erect a new garage, 50 by 75 feet, at Plymouth street and the boulevard. It will be one story, of brick, and will replace the garage recently destroyed by fire.

The Hearn Tire & Rubber Company, Cincinnati, O., has taken the agency for Kelly-Springfield tires, handling the product of the Consolidated Rubber Tire Company of Akron, in central Ohio.

N. V. & H. N. Porter, New London, Conn., is the latest firm to open a garage in that town. The firm handles the Maxwell car at 426 Bank street.

W. S. Hathaway has taken the agency for the Reo car, made by the Reo Motor Car Company, Detroit. His territory is Kansas City and the Southwest, in which he succeeds the C. L. Taylor Motor Company. The new agency will be known as the Southwest Motor Company, and will be located at 1616-18 Grand avenue, Kansas City.

The H. Eisner Company, Boston, the New England service department of the Eisemann Magneto Company of New York City, is issuing a neat postal folder calling attention to the fact that prompt service will be given in making repairs, etc.

The Remy Electric Company, Anderson, Ind., announces the appointment of the Lamb Electric Company, Grand Rapids, Mich., as representative of Remy ignition specialties.

The Lozier Motor Company, Detroit, has appointed W. L. Davis as eastern factory representative.

The Velie Motor Vehicle Company, Moline, Ill., announces the appointment of Fred E. Bradfield as manager of the Boston branch. He was formerly connected with the Chicago branch.

John A. Murphy, cashier of the Henderson Motor Sales Company, Indianapolis, Ind., has been placed in charge of the order department of that company.

TRADE INFORMATION EXCHANGE
BUSINESS PROPOSITIONS.

Two Classes of Opportunities Are Offered Below—for Agents to Secure New Lines, and for Manufacturers to Secure Agents. These Propositions Offer State and Community Representation to Makers of Pleasure Cars, Motor Trucks; Accessories and Supplies, While Dealers May Get in Touch with Manufacturers Desiring to Extend Their Agency Connections. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without the Names of the Firms, Which Desire Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding to the Concerns.

AGENTS WANTED.

761, Pleasure Cars—Territorial agencies open for the sale of a car with a standard chassis, equipped with either touring or runabout bodies, marketed with complete high grade equipment. Price for runabout, $1800 f. o. b. at the factory. The cars are guaranteed by the maker as high grade in every detail.

822, Pleasure Cars—Some especially desirable territory is open for a line of cars built with two types of chassis, 35 and 40 horsepower, two styles each of four and five-passenger bodies, and roadster. The cars are sold with excellent equipment throughout, at prices ranging from $1400 to $1700 f. o. b. at the factory. This line is produced by an old and thoroughly reliable firm and is well known.

804, Pleasure Cars—A large manufacturer of a popular priced car has an interesting proposition for those desiring the agency for such a machine. Two types of chassis are produced, one rated at 26 horsepower by S. A. E. formula and fitted with two types of runabout and five-passenger bodies, and the other fitted with five-passenger body only. Prices range from $1150 to $1500, fully equipped and f. o. b. at the factory.

772, Trucks—A desirable connection may be made by a number of agents for a line that includes both electric and gasoline delivery wagons and trucks. The machines are built by a concern of undoubted reliability, with large resources, and the guarantee given to purchasers is very broad. The factory attention given by this company is such as to justify careful inquiry. The range of prices is extremely wide, vehicles being produced for every requirement.

798, One-Ton Truck—Agencies can be established for a high grade service wagon of one ton capacity, made with but one chassis. The design is in every way mechanically consistent and the construction and material are unusually substantial. The machine is furnished with self-starting equipment, and the opportunity is one of distinct merit.

806, Delivery Wagon—The maker of a standard delivery wagon with a capacity of 1500 pounds, selling for $875 f. o. b. factory, wishes to establish agents throughout the country. The machines are well constructed, of high grade material, have all desirable equipment, with open body standard, and are sold with a broad guarantee. The line is one which will interest all desiring to secure the agency for a popular priced and reliable machine.

779, Delivery Wagon—Agents generally are required by a well established firm making a delivery wagon with a capacity of 3000 pounds. The vehicle is high grade in every respect, and possesses an unusual number of exclusive features which insure economy of time and attention and make for reliability. The price for the chassis ranges from $2200 to $2500 f. o. b. at the factory.

918, Delivery Wagons—Manufacturer of two types of delivery wagon, one of 1000 pounds and the other of 1500 pounds capacity, the first with enclosed and the latter with open body, will make attractive arrangements with live wire representatives. Some excellent New England territory is available. The machines sell for $1000 and $1050 f. o. b. at the factory.

814, Oil and Grease—The manufacturer of a well known and widely advertised line of automobile oils and greases has an agency contract proposition that is exceedingly liberal to offer to those who wish to connect themselves with a reliable and dependable firm. The oils and greases are of grades to meet every requirement and are produced from the highest class crudes by scientific refining.

816, Spark Plugs—A spark plug manufacturer, producing plugs that have exclusive and desirable qualities, wishes to establish a number of first class agencies. A liberal contract is offered and territorial rights will be given to those who can demonstrate their ability to secure business.

801, Plant Opportunity—A company manufacturing high grade pleasure car and motor truck wagon wheels in New York State, having excess factory space and facilities, will consider proposition to combine with a concern manufacturing automobile parts or completed vehicles. The plant is new, equipped with the latest machinery and ample power, has abundant water from artesian wells and good fire protection. The site covers four acres, with an 856-foot frontage on the railroad. The city is a rapidly growing one and possesses the best of freight and express shipping facilities. The company desires to increase its capital and business, and to the proper parties will lay the proposition open to the closest inspection.

801, Pleasure Cars and Trucks—Agencies are open for a line of high grade pleasure cars, trucks, municipal service wagons and fire department apparatus, widely known and well advertised, made by one of the best established manufacturers in the industry. Every class of vehicle required for business or pleasure is produced and the maker is prepared to afford factory service of a character calculated to secure results. The proposition is open only to those who can purchase a demonstrating machine and contract for a number of cars commensurate with the territory taken.

892, Delivery Wagon—An excellent opportunity is offered dealers who desire to handle a small delivery wagon possessing unusual merit. The car has a maximum capacity of 1600 pounds and sells for $750. Manufactured in Newark, N. J., it possesses unusual strength and reliability, coupled with the simplicity which was the keynote in designing the car. An excellent proposition will be made to dealers throughout the country.

893, Gasoline Gauge—The manufacturer of a new gasoline gauge wishes to secure dealer agents in all parts of the country. To established firms an attractive proposition will be submitted. The device is simple, reliable, and thoroughly protected by patents. It is sold at a price which makes it desirable for both dealer and user.

847, Electrical Goods—A large manufacturer of electrical goods, such as air compressors, pumps, polishing motors, and other appliances for garage and automobile use, desires agents in all parts of the country. To firms capable of handling a line of high class goods, an excellent proposition will be made. The concern is a well known one in the electrical field, and possesses a large organization, to which it desires to add a number of automobile firms.

LINES WANTED.

810, Accessories—A manufacturer of various specialties, located on the Pacific Coast, desires to secure the agency for automobile accessories of all kinds. Horns, lamps, tools, starters, etc., are desired, and a small line of supplies will also be carried. Manufacturers of well known and standard accessories and supplies are requested to submit their agency propositions, with catalogues and full information.

811, Accessories and Garage Equipment—A large machine shop in Vermont, making automobile and garage specialties, desires to secure agency relations with manufacturers of standard accessories, supplies, garage equipment and similar lines. The concern is an old established one, and contemplates entering the automobile business extensively.

929, Pleasure Cars and Trucks—The agency for two well known lines of cars in Omaha, Neb., wishes to expand and secure the representation of pleasure cars selling from $750 to $1250, and trucks from $800. The concern has been successful in handling two of the most prominent of the moderately priced lines of cars, and knows its field well. Consideration will be given only to nationally known cars which offer possibilities commensurate with the field.

833, Pleasure Cars and Accessories—The agency for a line of pleasure cars selling for not more than $2000 is desired by the proprietor of a Vermont garage. The locality offers an excellent opportunity and the man is well known and progressive. He also wishes to handle standard lines of accessories and supplies. The garage is to be improved, and catalogues are desired from manufacturers of garage and repair shop equipment and supplies.

760, Fire Apparatus—A man located in Boston desires to hear from manufacturers of fire apparatus of all kinds, including hose and chemical combinations, ladder trucks, motor propelled steam pumping engines, gasoline pumping engines, and speedy fire chief's cars. The market is an excellent one, and no time should be lost by manufacturer desiring to secure representation by this man.

968, Accessories—A new concern, located in Rock Island, Ill., and carrying a line of accessories, desires to increase its business by the addition of new lines. Well advertised articles of merit are wanted, and the company desires to build up a high class trade. Supplies are also desired, such as tires and oils. The company is a new one, but gives every evidence of success, and connection with it will no doubt prove of mutual profit.

946, Accessories, Supplies, Tools—The manufacturer of a line of pleasure and commercial cars, located in Wisconsin, desires to hear from manufacturers of automobile equipment, accessories, supplies and tools of all kinds. The company has been developing its agency for some time, and now plans to expand. Factory equipment and machine tools are also to be purchased.

889, Second Hand 'Buses—The owner of a rapidly growing and beautiful suburb of Jacksonville, Fla., desires to hear from firms having second hand 'buses for sale. The machines must be in good condition and capable of performing hard work, though neither bad roads nor long distances are to be covered.

911, Accessories and Supplies—A manufacturer and dealer in Illinois wishes to add to his lines of accessories, supplies, and miscellaneous equipment. Catalogues are wanted from manufacturers of such goods, with agency propositions. Well known and standard lines are desired, but a new article of merit will be handled, or manufactured if desired.

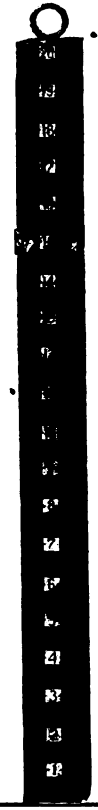
762, Pleasure Cars, Trucks and Supplies—Boston men desire to hear from manufacturers of pleasure cars, trucks and supplies, catalogues and full details of the agency propositions being wanted. It is contemplated to enter the business extensively, with several lines of cars and the more prominent accessories and supplies.

803, Accessories—A concern in New Bedford, Mass., desires to handle a general line of accessories. The more popular devices are desired, particularly those whose practicability and value has made them standard and in demand. The co-operation of the manufacturer with the dealer as well as the quality of the product and its advertising, will be considered.

764, Cars and Accessories—A subscriber to the Exchange, located in Boston, desires to enter the automobile business extensively, and wishes to hear from manufacturers of pleasure and commercial cars and camp wagons, accessories and supplies. Well advertised lines of quality are desired.

826, List of Motorcycle Accessories—A list of manufacturers of motorcycle accessories and parts is desired by a man located in Newtonville, Mass. The list must be reliable and complete, and include as many details of the firms as possible.

912, Dumping Bodies—A coal firm handling a large tonnage desires to hear from firms making motor truck bodies suitable for the coal trade. Those which deliver the coal at a height are desired. An apparatus of elevator buckets scooping the material from the body and delivering it where wanted is preferred.



Patented March 5, 1912.

GASOLENE GALLON GAUGE

For Automobiles and Motor Boats.

For measuring the amount of gasolene in supply tanks.

The numbered markers are slideable and may be adjusted to show the number of gallons in any given tank whether it is square, round, oval or irregular in shape.

The depth of each gallon is the same in square sided tanks.

In round or oval tanks the depth of the gallons will be less towards the middle of the tank.

The outside level marker shown is to register the amount in the tank at any given time.

Handsomely finished in black stained wood, 15 inches long, with 20 brass markers.

If your tank holds more than 20 gallons, extra markers will be inserted as ordered.

Price 50 cents postpaid anywhere in the United States.

Send Express or Postoffice money order. Stamps accepted.

SPECIAL.

Extra long gauges made to order for very deep tanks; not more than 24 inches in length, with markers numbered from 1 to 30 as may be required.

Price 75 cents, postpaid anywhere in the United States.

Manufactured by

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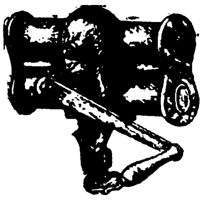
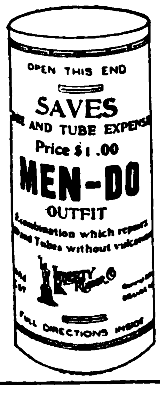
The Motor Truck
Monthly - - $1.00 the Year
The Automobile Journal
24 Issues - $1.00 the Year
The Accessory & Garage Journal
Monthly - - $1.00 the Year

Automobile Journal Publishing Company
TIMES BUILDING PAWTUCKET, R. I.



Send for Proposition on
HAWTHORNE FOUR CYLINDER PUMP
HAWTHORNE MFG. CO. Inc.,
29 Spruce St. Bridgeport, Conn.

PERFECTION SPRING COMPANY
High-Grade Pleasure Car and Motor Truck Springs
CLEVELAND, OHIO



TIRE SAVING
Is an economy that counts with every Auto owner.

==MEN-DO==

Will actually save from 50% to 90% Tire and Tube repair bills. $1.00. No heat required—only willing hands and a MEN-DO Outfit.

Write for folder D.

LIBERTY RUBBER CO.
ORANGE, N. J.

THE RUBBER TIRE-COATING

MAKES OLD TIRES LOOK NEW

Prevents deterioration and preserves the resiliency of new rubber. Waterproofs and keeps out grit and moisture. Lengthens the life and improves the appearance of tires. Will not wash off; can be removed only by wear. Contains nothing to injure the finest rubber.

12 ounce cans will coat 6 tires 50c
1 qt. cans " " 15 tires $1.00
1-2 gal. cans " " 30 tires $1.90
1 gal. cans " " 60 tires $3.60

Buy from your dealer, or send order with cash to us. We prepay charges.

PAGE-LESTER CO., 117 W. Van Buren St. CHICAGO, ILL.

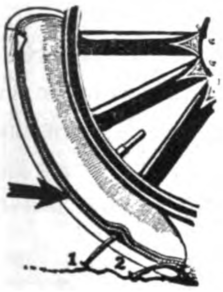
"BULLET PROOF"

Inner Tube Protecting Webbing.

Here is the simple, *logical* and *inexpensive* way of eliminating punctures and blowouts. A heavy woven webbing, made of *genuine* Sea Island cotton, tough as old oak, flexible as a glove. Simply slipped between inner tube and casing, and held in place by pressure---No bias places to pinch---Will not heat. Conforms to shape of tire.

"Just as if the inner Tube were that much thicker."

Carry an extra pair in your tool box for emergencies. Delivered direct to any address, charges paid, on receipt of price.



PRICE FOR ONE TIRE.

28x3 or 3 1-2	$2.00
30x3 1-2	2.15
30x4	2.40
32x3 1-2	2.40
32x4	2.70
32x4 1-2	3.00
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34x4 1-2	3.15
36x4	2.95
36x4 1-2 or 5	3.25

1. Showing webbing taking nail.
2. Turning nail

Made in all sizes.
Send for booklet No. 3.

WABAN WEBBING CO., 207 Essex St., Boston, Mass.

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The Oil Most talked about today.

The Oil with the 20,000 mile record.

Ask about it.

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NO-KARBON
(REGISTERED)
EAGLEINE
AUTO CYLINDER OIL

It suits and does not soot.

In 4 and 6 cylinder water cooled cars.

AGENTS

Proposition For Live Dealers

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TOURING

Is Delightful If the Brakes of Your Car Are Equipped With MULTIBESTOS.

THE GRIP
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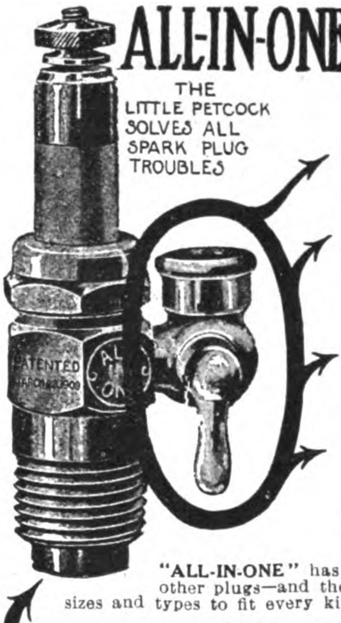
It is the Safest, Surest and Best Wearing Brake Lining and Gives You Confidence Under All Conditions. MULTIBESTOS Always Holds. Equip Your Car With It At Once.

Write for Book and Price.

STANDARD WOVEN FABRIC COMPANY, Worcester, Mass.

Boston, Mass., 903 Boylston St. New York, 237-9 LaFayette St.

ALL-IN-ONE SPARK PLUG



THE LITTLE PETCOCK SOLVES ALL SPARK PLUG TROUBLES

Prime your Motor by pouring a few drops of gasoline into this little petcock. It will start your Motor instantly on the coldest morning.

Clean the **Sparking Points** by opening the cock while the Motor is running. All soot is blown out immediately.

Detect the **missing cylinder** by opening all the petcocks while the Motor is running. It will quickly show you where the trouble is.

Clean out carbon by injecting a little kerosene once in a while. It's the simplest and best carbon remover known.

"ALL-IN-ONE" has the best features of all other plugs—and the Petcock besides. All sizes and types to fit every kind of Motor made.

Price $1.50

Frontier Specialty Co.
732 Main Street
BUFFALO - - NEW YORK.

A Statement of Fact!

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The ACCESSORY and GARAGE JOURNAL Is the Only Publication of Its Kind—Devoted Exclusively to the Interests Stated—In the Country. It Goes to All the Trade Because It Is a Trade Print in the Broadest Sense.

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SPRINGFIELD
Knox
MASSACHUSETTS

New Departure "TWO-IN-ONE" Ball Bearings

The only ball bearing that takes load from any direction with equal efficiency.
Catalog for the asking
THE NEW DEPARTURE MFG. CO.
Bristol, Connecticut

"STANDARD" TRUNK RACKS

Connecticut Steel and Wire Co., Hartford, Conn.

PREMIUM CRUDE STOCK
Is the Basis of
HARRIS
TRADE MARK REG. U.S. PAT. OFF.
OILS

That's why they are America's foremost lubricants.
Sold in one gallon and five gallon cans and in barrels.

A. W. HARRIS OIL CO.
326 S. Water St., Providence, R.I. 143 N. Wabash Ave., Chicago, Ill.

ABSOLUTE TIRE PROTECTION
GIVEN ONLY BY THE
Hopewell Tire Case
It prevents any water entering the spare tire (either from rain or hose used in washing.) Water rots the fabric and causes blowouts.
$3.00 to $4.00 according to size
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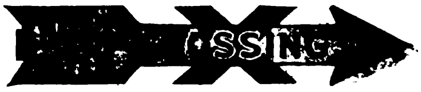
Neustadt's 1912, 200-page Automobile and Motor Boat Accessory Catalogue, free for the asking. Neustadt Automobile & Supply Co., 3200-2-4 Locust St., St. Louis, Mo.

Mr Dealer Join Us

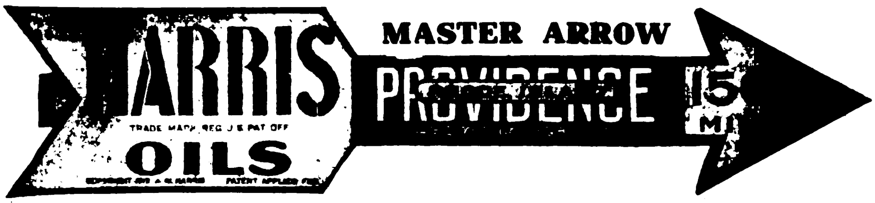
It won't cost you one red cent. It will be worth money to you and—it's yours if you want it!

In Our Co-operative Advertising Campaign

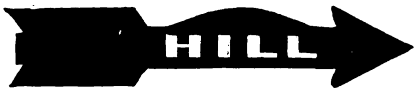
READ THE DETAILS:—We have prepared at very great expense, a series of Arrow Signs, to be placed by you along the principal highways. The set includes Master Arrows, Symbol Arrows, Dealer Arrows. The Master Arrow gives the approximate distance from your place to Providence, the home of Harris Oil, the Symbol Arrow is to designate crossings, curves, hills or bridges and at the same time will serve as a constant reminder of Harris Oil. The Dealer's Arrow or Local Wedge has your name and town printed on it for the purpose of telling where a supply of Harris Oil may be obtained.



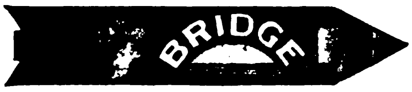
Actual Size, 20 inches long, 4 inches wide.



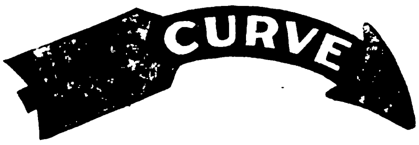
Actual Size, 36 Inches long, 8 inches wide.



Actual Size, 20 inches long, 4 inches wide.



Actual Size, 20 inches long, 4 inches wide.

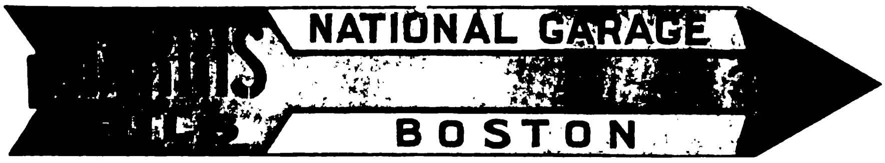


Actual Size, 20 inches long, 7 inches wide.

Here we illustrate the Master and Symbol Arrows. These illustrations convey no idea of their beauty and distinctiveness. They are lithographed in red, yellow and black on substantial metal. They will last for many years.

This plan of ours has met with remarkable enthusiasm. Motorists everywhere are clamoring for warning signs—our Symbol Arrows are just what is wanted. They will accomplish much good for the motorist, you and ourselves and we want you to reap the benefits.

This Is Your Own Arrow



Actual Size, 28 inches long, 5 inches wide.

Isn't it a splendid ad. for you? Can you beat it? Just imagine these along the roads in your vicinity. The finest kind of publicity for your business.

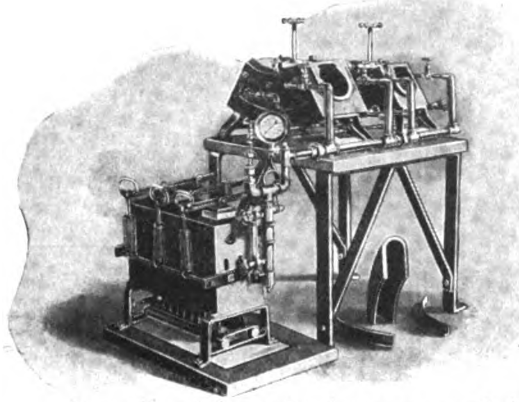
Don't Overlook This Great Opportunity. **Send Your Requisition To-day.**

To obtain a supply of Arrows, it is necessary to notify us as to the number of highways leading to your place upon which you desire to place Arrows. Send your full name and address. The Arrows are going fast. First come—first served. Write to-day. Do it **now!**

A. W. HARRIS OIL COMPANY

306 South Water Street, PROVIDENCE, R. I.
143 No. Wabash Avenue, CHICAGO, ILL.

Large Profits in Tire Repairing



EITHER as part of a garage and general auto repair business or as a separate venture. Requires very little capital to equip a shop completely with the best tire repairing outfit in the world. The equipment can be paid for and a good profit made by the first season's work. Every motorist must have tires repaired—every motorist in your vicinity is a possible customer for tire repairing. Get the right kind of equipment—one that produces work that you can guarantee—the Akron-Williams Tire Repair Equipment which was designed by practical tire factory repairmen.

Localized heat is the secret of the Akron-Williams. Three separate steam chambers in each of our sections, our exclusive patented feature, limit the curing process to the repaired part. Proof that the Akron-Williams is the best is the fact that the big tire manufacturers use it—Firestone, Goodyear, Diamond, Republic, Pennsylvania, Revere, Hartford, Consolidated, Empire, Manhattan, Shawmut and many other tire manufacturers are among our customers. They know by experience what is most practical. We can equip a tire repairing plant of any desired capacity. Don't delay getting into this profitable business. Get into correspondence with us to-day. Write for Bulletin 12 anyway.

IF IT'S USED TO REPAIR TIRES, WE MAKE IT

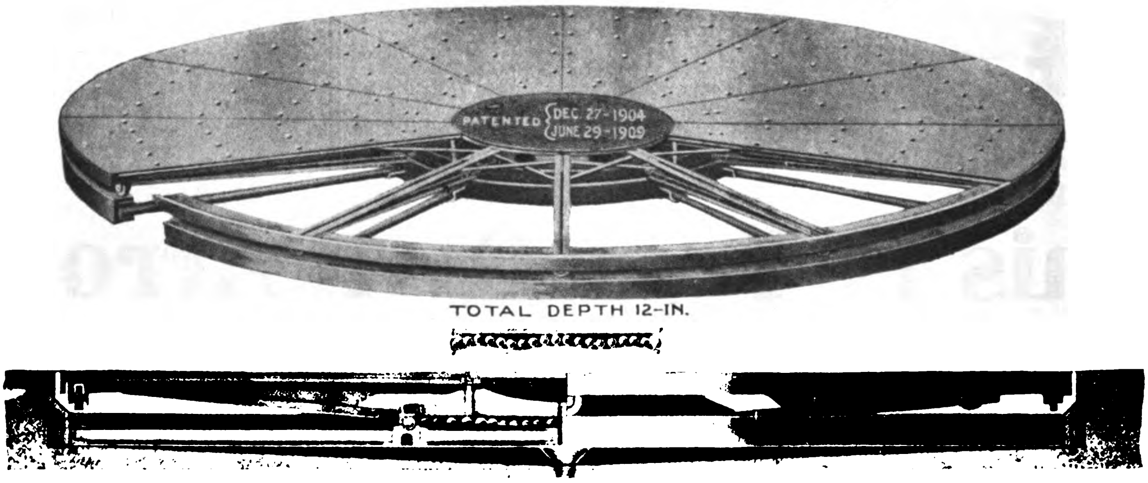
Casing Repair Vulcanizers
Air Compressors and Tanks
Steam Boilers
Inside Patch Vulcanizers
Buffing Stands
Tube Repair Vulcanizers
Pot Heaters and Steel Vulcanizers
Coil Springs for Retreading
Retreading Molds, etc., etc.
Rotary Rasps, Wire Brushes

WRITE TO-DAY—NOW—FOR CATALOG 12.

The Williams Foundry & Machine Co., Ash St., Akron, O.

NOW IS THE TIME

When every garageman is busiest and when every labor-saving device is both appreciated and welcomed. Have YOU ordered YOUR "Universal" Auto Turntable and "Universal" Auto-Jack and Emergency Truck ?


PATENTED DEC. 27-1904 JUNE 29-1909
TOTAL DEPTH 12-IN.
CONCRETE ANY DEPTH AND GROOVED TO WATER DRAIN

No more backing your cars in and out of your garage if you use a "UNIVERSAL." It will save you time, floor space and money. Do away with any possibility of accidents and attract you many new customers by making YOUR garage up-to-date.

Our Auto-Jack is a great time and money saver too. With it you can jack up both front wheels or both rear wheels of your car at one time and when car is on jack, you can move to any part of your garage.

Better write today for catalog "C-4" describing both Turntable and Jack. When writing kindly state wheel base of your largest car so we can figure proper size of table for your use.

THE CANTON FOUNDRY AND MACHINE CO., Canton, Ohio

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, Mass.
Branch: 113 Massachusetts Ave., Boston, Mass.
Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.
Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York City.
Miller, Chas. E., 97-103 Reade St., New York City.
Branches: 202-204 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York City; 1421 Bedford Ave., Brooklyn, N. Y.; 818 North Broad St., Philadelphia, Penn.; 324 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.
Milwaukee Auto Specialty Co., 123 Second St., Milwaukee, Wis.
Waite Auto Supply Co., 81 Exchange place, Providence, R. I.

ACETYLENE TANKS.

Prest-O-Lite Company, 271 East South St., Indianapolis, Ind. (Prest-O-Lite.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILE PUBLICATIONS.

The Automobile Journal, 24 issues, $1.00 the year.
The Motor Truck (Commercial Car), monthly, $1.00 the year.
The Accessory and Garage Journal, Monthly, $1.00 the year.
The A B C of Motor Car Operation .... .50
The A B C of Aerial Navigation. .50
The A B C of Internal Combustion Engine, Maintenance and Repair .... .35
The A B C of Carburetor Construction, Maintenance and Repair .... .35
The A B C of Magneto Systems .35
The A B C of Battery Ignition Systems .... .30
The A B C of Motor Car Chassis, Maintenance and Repair...... .25
Maintenance and Repair of Motor Car Tires.......... .25
Lighting the Motor Car by Electricity .... .25
Overhauling, Rebuilding and Equipping the Motor Car..... .50

Sent Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass. (R. I. V.)
Bretz Co., J. S., 250 W. 54th St., New York City (F & S.)
New Departure Mfg. Co., Bristol, Conn.

BATTERIES.

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York City.
Lincoln Electric Co., 1007 Atlantic Ave., Brooklyn, N. Y. (Hi-Po Waterproof Dry.)
Waite Auto Supply Co., 81 Exchange place, Providence, R. I. (Success.)
Willard Storage Battery Co., 5716 Euclid Ave., Cleveland, O. (L B A.)

BLOWOUT PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 480 Housatonic Ave., Bridgeport, Conn. (Raybestos.)
Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston, Mass.; 237 Lafayette St., New York, N. Y.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARBURETORS.

Sumner, George, Inc., 1841 Broadway, New York; 755 Boylston St., Boston. (Rayfield.)

CARS—GASOLINE PLEASURE.

Atlas Motor Car Co., 104 Birnie Ave. Springfield, Mass. (Atlas-Knight.)
Branch: N. E. corner Broadway and 64th St., New York City.
Berkshire Motors Co., Cambridge, Mass. (Berkshire.)
Brush Runabout Co., 3 West 61st street, New York City. (Brush runabout, Liberty-Brush.)
Buckeye Mfg. Co., Anderson, Ind. (Lambert.)
Cartercar Co., Pontiac, Mich. (Cartercar.)
Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)
Cole Motor Car Co. See Henderson Motor Sales Co.
Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)
Dayton Motor Car Co., 3 West 61st street, New York City. (Stoddard-Dayton.)
Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)
Henderson Motor Sales Co., Indianapolis, Ind. (Cole.)
Eastern Distributers: Colt-Stratton Co., Broadway at 68th St., New York City.
Herreshoff Motor Co., 620 Harper Ave., Detroit, Mich. (Herreshoff.)
Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit, Mich. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.
Ideal Motor Car Co., Indianapolis, Ind. (Stutz.)
Imperial Automobile Co., Jackson, Mich. (Imperial.)
Inter-State Automobile Co., Dept. N, Muncie, Ind. (Inter-State.)
Branch: 153 Massachusetts Ave., Boston, Mass.
Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)
Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)
Knox Automobile Co., Springfield, Mass. (Knox.)
K-R-I-T Motor Car Co., Detroit, Mich. (K-R-I-T.)
Lenox Motor Car Co., Inc., Boston, Mass. (Lenox.)
Branches: New York City, Chicago, Boston.
Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)
Mercer Automobile Co., 1100 Whitehead road, Trenton, N. J. (Mercer.)
Michigan Buggy Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)
National Motor Vehicle Co., 1033 22nd St., Indianapolis. (National.)
Nordyke & Marmon Co., Indianapolis, Ind. (Marmon.)
Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)
Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: 660 Beacon St., Boston, Mass.; Broadway and 57th St., New York City; Michigan Ave. and 25th St., Chicago, Ill.
Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)
R-C-H Corporation, 107 Lycaste St., Detroit, Mich. (R-C-H.)
Reo Motor Car Co., Lansing, Mich. (Reo.)
Sampson Mfg. Co., Alden, 3 West 61st St., New York (Sampson.)

BUYERS' GUIDE---Continued

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit, Mich. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st street, New York City. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit, Mich. (Warren-Detroit.)

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: 320 Newbury St., Boston, Mass.; Broadway and 62nd St., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 So. Michigan Ave., Chicago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 840 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Available Truck Co., 2334 Hamilton Ct., Chicago, Ill. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st street, New York City. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Federal Motor Truck Co., 114 Isabella St., Detroit, Mich. (Federal.)

General Motors Truck Co. 1302 Jefferson Ave., East, Detroit (G.M.C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit, Mich. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis, Ind. (Mais.)

McIntyre Co., W. H., Auburn, Ind. (McIntyre.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.)
Branches: See Cars, Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st street, New York (Sampson.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st street, New York City. (Sampson, Brush, Stoddard.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., Detroit, Mich. (Anderson.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit (G.M.C.)
Branches: See Cars, Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York (Sampson.)

United States Motor Co., 3 West 61st street, New York City. (**Sampson.**)

Victor Motor Truck Co., 1010 Ontario St., Buffalo, N. Y. (Victor.)

White Co., The, 340 E. 79th St., Cleveland, O. (White.)
Branches: See Cars — Gasoline Pleasure.

Willys-Overland Co., Toledo, O., (Overland.)

CHAINS, TIRES, AND ANTI-SKIDDING DEVICES.

Leather Tire Goods Co., Suspension Bridge Sta., Niagara Falls, N. Y. (Woodworth Treads, Kant-Skids.)

Weed Chain Tire Grip Co., 28 Moore St., New York City. (Weed.)

CHAINS — TRANSMISSION OR DRIVING.

Miller, Chas. E., 97-103 Reade St., New York City (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES, FRICTION.

Brets Co., J. S., 250 W. 54th **St., New** York City (Hartford cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

CRANES.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Co., (Prest-O-Carbon Remover.) See under Acetylene Tanks for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 480 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

GAUGES, ETC.

Goodnow Mfg. Co., 754 Old South Bldg., Boston, Mass. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Tire Pressure and Gasoline Tank Gauges.)
Branches: In all principal cities.

HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

HORNS.

Automobile Supply Mfg. Co., 220 Taaffe Place, near DeKalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Falchney Co., Boston, **Mass.** (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.
Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, **Mass.;** 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; Ocean and Third Aves., Asbury Park, N. J.; 1524 Grand Ave., Kansas City, Mo.; 801 Woodward Ave., Detroit, Mich.

LAMP COVERS.

Hopewell Brothers, Newton, **Mass.** (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)

Esterline Company, The, La Fayette, Ind. (Matchless.)
Branches: Detroit, Mich.; **San** Francisco, Cal.; 114 Liberty St., New York City; 196 Pine St., Atlanta, Ga.; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn., 810½ Chapel St., New Haven, Conn.

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O.

Remy Electric Co., Anderson, Ind (Remy.)

Sager Co., J. H., 271 South **Ave.,** Rochester, N. Y.

LOCK SWITCHES.

Blackburn Specialty Co., 1120 Pros-

BUYERS' GUIDE---Continued

peet Ave., S. E., Cleveland, O. (Autolock.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York City (Colonial.)
Branches: Boston, Mass.; Fall River, Mass.; Philadelphia, Penn.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York City (Lubroleine.)
Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Havoline Oil Co., 17 Battery Place, New York City (Havoline.)
Branches: Pacific Coast — Kohl Bldg, San Francisco, Cal; Western—People's Gas Bldg., Chicago, Ill.; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Haws, Geo. A., 77 Pine St., New York City. (Panhard.)
Branch: 899 Boylston St., Boston.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.)
Branch: 284 Columbus Ave., Boston, Mass.

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston, Mass.; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRoL, Non-Fluid, Kejex.)

Standard Oil Co., New York City (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York City.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston, Mass.; 605 Brown Bros. Bldg., Philadelphia, Penn.; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Bretz Co., J. S., 250 W. 54th St., New York City (U. & H.)

Kimball Mfg. Co., The, Motor Mart, Boston, Mass. (Mea.)

K-W Ignition Co., The, 2329 Chester Ave., Cleveland, O.

Marburg Bros., 1777 Broadway, New York City (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., Walton Ave. and 138th St., New York City.
Branches: 1679 Broadway, New York City; 1110 South Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-436 Van Ness Ave., San Francisco, Cal.; 868 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MATS, ETC.

Sidwell Pedal Mat Co., 245 Columbus Ave., Boston, Mass. (Pedal.)

MEASURES, ETC.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston (F. N.)
Branches: 49 Union St., Providence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.)

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Liberty Rubber Co., Orange N. J. (Motorcycle Rubber-Mend.)

Swenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 785 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

OIL AND GREASE PUMPS, ETC.

Randall-Faichney Co., Boston, Mass. (B-Line.)

PATCHES.

Liberty Rubber Co., Orange N. J. (Cementless.)

PUMPS, TIRE.

Brown Co., The, Syracuse, N. Y. (Brown Impulse.)

Clarke Pump Co., 1489 Washington St., W. Newton, Mass. (Crown.)

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS — REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)
Branches: New York, Chicago, San Francisco.

RIM REMOVERS.

Wm. L. Tobey, 20 Lewis St., East Boston, Mass. (S. D.)

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York City (Tarvia.)
Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash.; London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

RUBBER CEMENT.

Liberty Rubber Co., Orange, N. J. (Liberty Patching.)

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland, O. (L B A.)
Branches: 136 West 52nd St., New York City; 1191 Woodward Ave., Detroit, Mich.; 436 South Dearborn St., Chicago, Ill.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston, Mass.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York City; 222 Eliot St., Boston, Mass.; Teck Building, Buffalo, N. Y.; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

George Sumner, Inc., 1841 Broadway, New York; 55 Boylston St., Boston. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo, N. Y. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Janney, Steinmetz & Co., Philadelphia, Penn.

Kimball Mfg. Co., Motor Mart, Boston (Lodge Double-Pole.)

Randall-Faichney Co., Boston, Mass. (Mac-Kae.)

Progressive Mfg. Co., The, Torrington, Conn. (Black Eagle.)

Splitdorf Electrical Co., Walton Ave. and 138th St., New York City.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS, ETC.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York City; 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van

BUYERS' GUIDE---Concluded

Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)

Branches: 1812 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.; 1212 South Main St., Los Angeles, Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Ave., Indianapolis, Ind.; 1825 Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)

Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 870 Woodward Ave., Detroit, Mich.; 330½ North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 202 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis, Mo.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia, Penn.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIMERS AND SPARK COMMUTATORS.

K-W Ignition Co., 2829 Chester Ave., Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)

Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)

Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1197 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Diamond Rubber Co., Akron, O. (Diamond.)

Empire Tire Co., Trenton, N. J.

Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia.

Firestone Tire & Rubber Co., Akron, O.

Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass. (Fisk.)

Branches: 811-813 Boylston St., Boston, Mass.; 17½ Dorrance St., Providence, R. I.

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)

Branches: In principal cities.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Continental, G & J, Hartford, Morgan & Wright.)

Branches: See Rims—Removable and Detachable.

TIRE INFLATING TANKS.

Prest-O-Lite Co., (Baby Tire Filler, The Emancipator.) See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

Leather Tire Goods Co., Suspension Bridge Station, Niagara Falls, N. Y. (Woodworth treads, repair boots and emergency stops.)

Liberty Rubber Co., Orange, N. J. (Treadmend and Everstick.)

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley & Co., C. O., Rahway, N. J. (C. O. T. Tire Solder.)

TIRE REPAIR OUTFITS.

Liberty Rubber Co., Orange, N. J. (Mend-Do and Rubber-Mend.)

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special. Motz Cushion.)

Branches: New York, Philadelphia, Chicago, Detroit, Kansas City, Cleveland.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York City (Morgan & Wright, G & J.)

Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)

Branches: See Tire Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.

Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., The, Chicopee Falls, Mass

Branches: See Tire Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)

Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York City.

Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)

Branch: 1974 Broadway, New York City.

TRUCK BODIES.

Lynch Manufacturing Co., Hammond, Ind.

Branches: East Chicago, Ind.; South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit, Mich.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

TURNTABLES.

Canton Foundry & Machine Co., Canton, O. (Universal.)

Lansing Co., formerly **Lansing** Wheelbarrow Co., Lansing, Mich.

Branches: Factory, Parkin, Ark.; 78 Cambridge St., Boston, Mass.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Minneapolis, St. Paul.

Portland Garage, Portland, Me. (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York City (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VULCANIZERS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O. (Garage and Individual.)

Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WASHING DEVICES.

Perfect Mfg. Co., Albany, N. Y.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis (Prest-O-Welder.)

Branch: See Acetylene Tanks

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New New York City (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, Geo. A., Taunton, Mass.

Walworth Mfg. Co., Boston, Mass. (Stillson.)

THE ACCESSORY -AND- GARAGE JOURNAL
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VOL. II. PAWTUCKET, R. I., JUNE, 1912. No. 2

THREE MILLION DOLLARS FOR EVERITT.

Flanders Group Represented in Reorganization of Metzger Concern---Weed Chain Secures Another Important Victory--Klaxon-Miller Suit Withdrawn---Latest Appointments and Promotions.

The various rumors concerning the reorganization of the Metzger Motor Car Company, Detroit, maker of Everitt cars, appear to have been set at rest by the incorporation of the Everitt Motor Car Company, under the laws of Delaware, for $3,000,000, by Byron F. Everitt, Paul Smith and Harry W. Davis. The new concern has taken over the manufacture of the Everitt. It may be mentioned, in passing, that the old company was capitalized for $1,000,000.

As yet no definite plans have been announced. A large number of men formerly connected with the Studebaker Corporation have joined those associated with the Metzger Motor Car Company. B. F. Everitt is president and Paul Smith vice president. The latter formerly was sales manager of the E-M-F and Flanders business of the Studebakers. W. E. Flanders, whose name has been associated with the new concern, is said not to be directly connected with the enterprise. Vice President Smith, who also is sales manager of the Everitt Motor Car Company, makes the following statement:

"No new models are contemplated nor any changes, even the slightest, will be made, either in the mechanical features, prices or in any other way. The advent of the Flanders group in the Everitt company simply means that the capital has been increased from $1,000,000 to $3,000,000, and this means three times the factory capacity and three times the output. In short, it will relieve any condition which has confronted our dealers everywhere and will enable them to meet more nearly the demand for Everitt cars than they have been able to do in the past."

STUDEBAKER SEES NEW ERA.

According to Clement Studebaker, Jr., first vice president of the Studebaker Corporation, maker of the E-M-F and Flanders cars and Studebaker electrics, the automobile industry has entered upon a new era. He holds that business practises which have been in vogue must be replaced by more substantial efforts with respect to the future. What this future will be, he is unable to venture a guess, but he suggests that some idea may be gleaned from the fact that if the cars produced by his concern this year were placed end to end, they would extend from New York to Boston, a distance of 214 miles.

"The automobile business cannot be run in the future as it has been in the past," says Mr. Studebaker. "The automobile is no longer an experiment, a novelty or a toy. It is an immensely important mechanical feature of our natural life. The wild cat times are over. Mushroom growths are at an end. The rush into automobile manufacture, the craze for flash and novelty, the systems of making and selling, the reckless disregard of after service in a car, will not be tolerated, and careful manufacturers must think of the future."

WEED CHAIN DECISION.

Judge Coxe, in the United States court of appeals for the second district, sitting in New York City, handed down a decision June 7, in an action brought by the Weed Chain Tire Grip Company, and others, against the Atlas Chain Company. The case was brought before this court on an appeal by the defendant. It hinges upon the interpretation of the so-called Parsons patent, granted to Harry Parsons, March 24, 1903, for an improved "anti-slipping and anti-puncturing device for the tires of vehicles and like purposes," and employed in Weed chains. The opinion of Judge Coxe is of special interest and is in part as follows:

> The device which is the subject of the patent consists of a network of rings, or strips of metal, or a series of small chains, or bands, fitted loosely over the periphery of the wheel or passing from side to side across the tire and prevented from coming off by two rings, hoops, or their equivalent, such rings, or one of them, being provided with means of attachment and detachment. The said rings are smaller in diameter than the periphery of the wheel and cannot come off accidentally. The rough surface provided by the network, chains or the like, will prevent the slipping of the tire on the road and the consequent skidding of the tire.
>
> It is probable that the genius of the inventor will yet devise a more simple and efficient method of preventing the skidding of rubber tired vehicles, but so far as the art has developed, Parsons appears to have been the first to provide means which minimize the greatest

danger which confronts the traveller in such vehicles.

The first claim of the patent, which is typical of the other five, is as follows: "Anti-slipping or protecting means for the peripheries of wheels, pulleys or the like, comprising attaching elements at opposite sides of the wheel, and an anti-slipping or protective medium secured to the attaching elements and extending across and around the periphery of the wheel, said parts being disconnected, though retained on the wheel whereby the anti-slipping or protective medium is free to move or shift its position around the periphery thereof."

It is said that the words, "fitting loosely over the periphery of the wheel," in the description and the words, "free to move or shift its position around the periphery thereof," in the claims, require a construction that the cross chains shall be so loose that they must necessarily hang in loops from the supporting wires and be successively laid down upon the ground immediately in front of the tread of the tire. There is nothing in the prior art requiring such a construction, and, if adopted by the court, it will enable any chauffeur who has wit enough to contract the circumferential support so that the cross chains are drawn more tightly across the tire, to evade the patent with impunity. "Loosely" is here used in contradistinction to "tightly" and means that the cross chains must be sufficiently loose to secure the advantages of the invention; viz., to creep and not pound the road as they would do if rigidly fastened to the wheel, when travelling at a high rate of speed.

That the defendant's grip creeps is expressly admitted, as is also the contention that if by use the cross chains become loose so that they are free to move or shift their position around the periphery of the wheel, the device becomes an infringement. It is also clear that the defendant's device may be so adjusted that the chains are held loosely, and if the driver of the car becomes satisfied that the best results can only be attained by a loose adjustment, it is more than probable that he will adopt that method. In other words, the defendant places in the hands of the chauffeur an apparatus which may infringe or not, according to whether it is wound up loosely or tightly. When the defendant sells a device, the natural, usual and preferential use of which constitutes an infringement, it is no answer to assert that it is possible, by limiting its efficiency, to use it innocently.

We cannot avoid the conclusion that the changes made by the defendant are attempts to secure the fruits of Parsons' invention by alterations in non-essential details.

The history of the protracted litigations shows that, with few exceptions, the courts have regarded the Parsons invention as a meritorious one and have given it a construction sufficiently liberal to include all changes of form which accomplish the same result in substantially the same way.

The defendant was practically selling the patented grip in all its essential details, but in addition it provided tension springs with directions to make a tight fitting grip. The springs may or may not be used, and the directions may or may not be followed, but even if they are followed, the same result is obtained, only in a less degree; the circumferential creeping of the cross chains is not so marked.

Believing the invention to be a meritorious one, we decline to limit the claims as practically to invalidate the patent.

MILLER SUIT WITHDRAWN.

Because of the prominence of the defendant, Chas. E. Miller, 97-103 Reade street, New York City, who has been engaged in the automobile accessory business, as manufacturer, exporter, importer and jobber for 16 years, being in fact the pioneer accessory house in America, the action of the Lovell-McConnell Manufacturing Company, Newark, N. J., against this concern, asking for a preliminary injunction restraining it from dealing in Klaxon horns, is of decided interest. Inasmuch as Miller has 15 stores in eight states throughout the country, the outcome of the suit is of far reaching effect.

Miller also handled Newtone horns, made by the Automobile Supply Manufacturing Company of Brooklyn, N. Y., and it was claimed by the Klaxon people that this device infringed theirs. The action was brought on the ground that Miller's position as representing both horns was in violation of the conditional license granted by the patentee. After it was brought, much correspondence passed between Miller and the Lovell-McConnell company, as a result of which Miller declared the Klaxon product would be handled no longer under any condition.

When the matter came before the United States district court in New York City early in the month, the motion for the injunction was withdrawn by the plaintiff. Arthur W. Weil, Miller's attorney, states that this action was voluntary, after the defendant announced it was ready to argue the motion.

JOINS MICHIGAN FORCES.

W. H. Cameron, for four years chief engineer with the Willys-Overland Company, Toledo, O., has accepted a similar position with the Michigan Buggy Company, Kalamazoo, Mich., maker of Michigan cars. Mr. Cameron is well known throughout the entire industry as one of its foremost engineers and designers.

In 1902 he was with the Daimler Automobile Company of Long Island City, N. Y., a concern that was at that time engaged in the production of the American Mercedes. From that position he joined the forces of the Packard Motor Car Company, about the time it was building its Detroit factory. In 1904 he went to the Olds Motor Works in Detroit, and when that plant was removed to Lansing, Mr. Cameron went to Indianapolis to take charge of the automobile work of the Nordyke & Marmon Company. Two years and a half later he became associated with the Gibson Company of Indianapolis, and joined John N. Willys in the manufacture of Overland cars in 1908.

W. H. Cameron, Chief Engineer, Michigan Buggy Company.

Under Mr. Cameron's guidance the plans for enlarging the production of Michigan cars will be put into effect at once. These plans are the result of the Michigan car's remarkable success in the market during the past three years; in fact, since the first car of this make was duly announced. With the Michigan Buggy Company's large resources, its live, progressive policies and its immense factory facilities, Mr. Cameron has an unexcelled field for his future work.

CORRECTION OF ERROR.

In the last issue of The Accessory and Garage Journal, announcement of the election of officers for the Croxton Motor Company, Cleveland, O., was made in which there appeared a decided error. The correct list is as follows: President, J. P. Stoltz; vice president, Charles H. Stevens; treasurer, O. A. Peters; secretary, I. Zimmer. All of these, with the exception of the secretary, and J. R. Stoltz and C. Cosgray, are directors.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from May Issue.)

The machine shown at Fig. 39 is the six-cylinder type recently produced by the U & H company, and as will be evident from the view of the exterior of the device shown at A, the machine can only be distinguished from the single sparking types by the additional pair of magnets and the double distributor block. The double armature is shown at B, and is to all intents two shuttles bolted together with separate high-tension collector rings, one at each end but having a common condenser, the brass case of which serves as a rigid coupling between the two members. This is earthed or connected to the ground by a carbon brush carried in the cover plate above the armature tunnel. One end of each primary winding is grounded in the ordinary way, but otherwise the windings on the two armatures are entirely distinct.

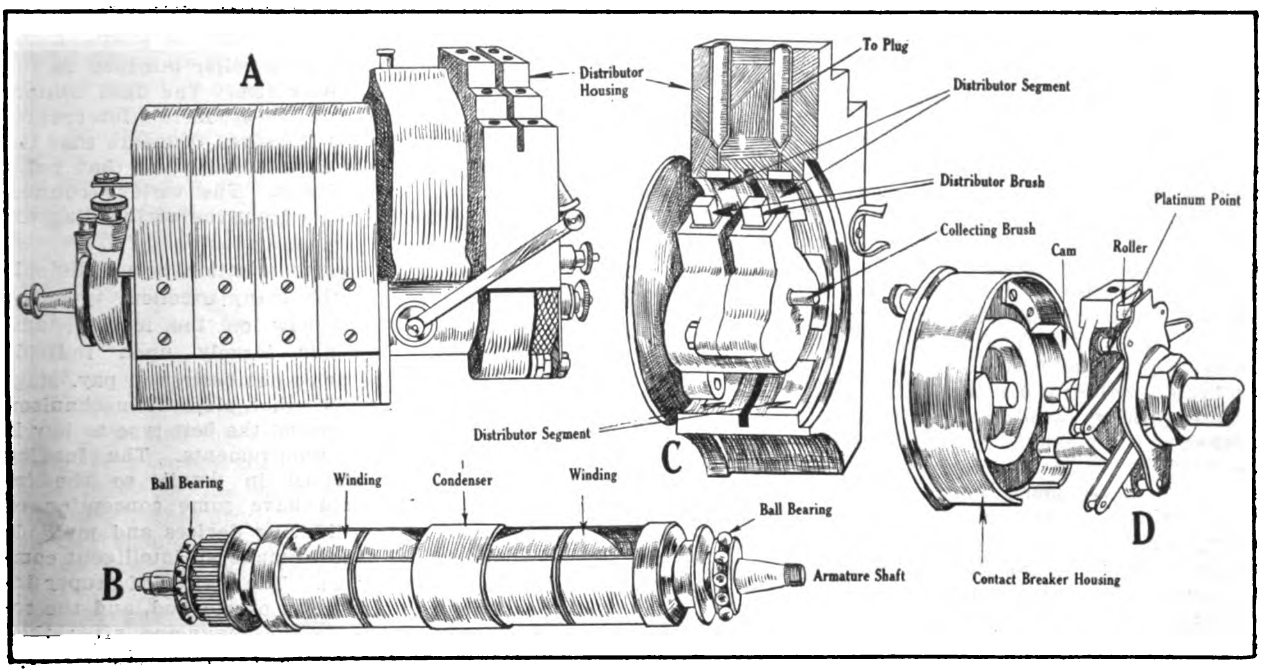

Fig. 39—Features of the U & H Double Magneto, Which Practically Consists of Two Instruments Coupled Tandem.

At the driving end, distinguished by the tapered shaft, the high-tension current is collected and delivered to its particular distributor brush by a carbon pencil and a bridge piece passing to the distributor underneath the magneto arch as in the conventional types. At the other end the collecting ring supplies current to the brush by the brush let into the side of the armature tunnel extension, and this is connected to the distributor by an external lead communicating with the brush in the vulcanite distributor cover.

The cross section of the distributor is shown at C and requires but little explanation, being merely two entirely independent brush carriers mounted on a common shaft and set on the same plane, the distributing brushes each engaging their respective set of brass segments in the outer case. The double contact breaker is shown at D; this is practically the same as the single contact breaker used on the U & H machines except for the addition of another pair of platinum contact points. One pair of these is grounded, the other two are insulated and are carried in a plate fulcrumed at the bottom. The points are forced apart by cams in the contact breaker cover acting against the member carrying the insulated pair of platina by a loose roller carried in a box at the top of the main body.

As the platinum points are separated simultaneously, and the armature shuttles and windings reach the position of maximum current strength at the same time, it is evident the sparks will occur at precisely the same instant in the cylinders. Thus on a T head motor, for instance, one could place one spark plug in the inlet valve cap, the other over the exhaust member and the charge would be kindled from two points instead of one, as in the single spark system. The flames would then travel toward the common centre, whereas with a single spark, the single flame would have to travel the entire distance across the top of the combustion chamber before igniting the gas at the other side, this producing lag which might affect the engine's efficiency at high speed.

The K-W arc flame magneto differs from the types previously considered in that there is a stationary coil, the armature member consisting of a pair of inductors revolving between the pole pieces and in the magnetic field created by the large permanent magnets. The details of construction can be easily grasped by referring to Fig. 40, the principal members being clearly shown in the longitudinal section, while the arrangement of the distributor and contact breaker is outlined in the end elevation. The method of current production is similar to the inductor magneto previously described, except that the stationary coil has two windings, a primary and secondary, the high-

---

*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

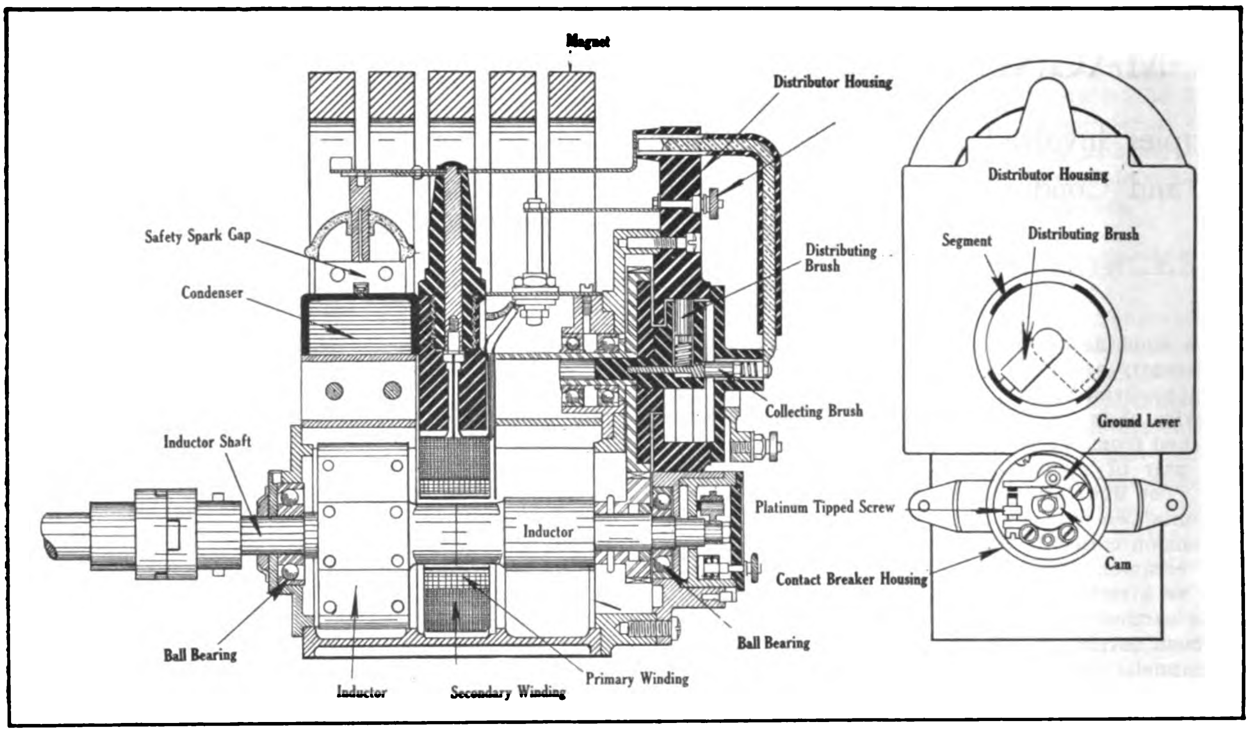
Magnet
Distributor Housing
Safety Spark Gap
Condenser
Distributing Brush
Collecting Brush
Inductor Shaft
Inductor
Platinum Tipped Screw
Contact Breaker Housing
Ball Bearing
Ball Bearing
Inductor
Secondary Winding
Primary Winding
Distributor Housing
Segment
Distributing Brush
Ground Lever
Cam

Fig. 40—K-W High-Tension Magneto Employs Stationary Double Winding and Revolving Inductors.

tension current being produced directly in the winding instead of in a separate transformer coil.

The only revolving part is the rotor, which is constructed of two members made of many fine laminae of soft Norway sheet iron riveted together and accurately fitted to the rotor shaft. These are mounted at right angles to each other. The winding, which is concentric with the rotor shaft, is mounted between the two halves of the rotor and is stationary. These revolving inductors collect the magnetism from one pole piece and conduct it through the centre of the winding to the pole piece of opposite polarity, thus giving a powerful wave of current from a quarter revolution of the rotor shaft.

The primary winding goes through the circuit breaker of the magneto, as in conventional forms and the interruption of the current by the separation of the points takes place when the induced energy is at its maximum value. The current from the secondary winding goes straight up through the hard rubber terminal to the bus bar which conveys it to the centre of the distributor, the revolving member selecting the various segments to which the spark plugs are connected as it turns.

The circuit breaker parts are mounted in the contact breaker housing, the points being separated by the direct lift action of a hardened steel cam carried by the rotor member raising a roller attached to the grounded contact point lever arm. The fixed contact point is insulated from the rest of the interrupter parts and can be adjusted if desired to insure that the gap between the points is maintained to that point making for highest efficiency. The various connections can be followed easily from the wiring diagram at Fig. 41.

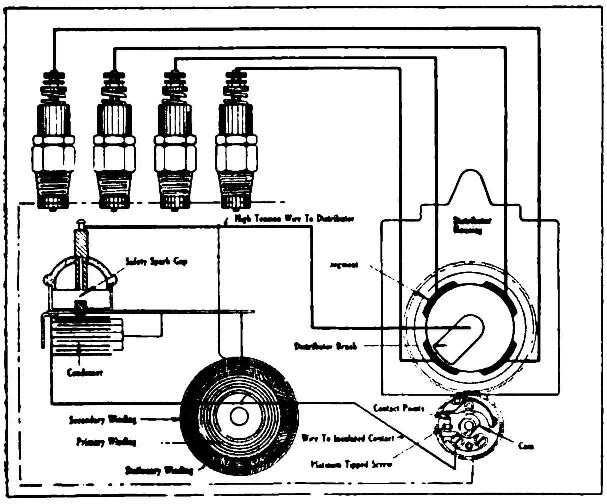
High Tension Wire To Distributor
Distributor Housing
Safety Spark Gap
Segment
Distributor Brush
Condenser
Contact Points
Secondary Winding
Primary Winding
Wire To Insulated Contact
Cam
Platinum Tipped Screw
Stationary Winding

Fig. 41—Diagram Showing Wiring of K-W Magneto.

The problem of magneto selection is not difficult of solution because of the many excellent types of these current producers now on the market, and the type chosen depends largely upon individual preference and the price one desires to pay. Magnetos, as is true of every other piece of mechanism, differ in quality and finish and the best type to buy is governed also by the requirements. The leading forms have been described in detail, so the intending purchaser should have some conception of the advantages of the differing devices and methods of operation, and be able to make an intelligent comparison between the types. The matter of proper installation is one that is often overlooked, and the repair and maintenance of the magnetos after they have been in use for some time should also be considered because of its importance in obtaining efficient and satisfactory service.

In fitting magnetos there are several points to be observed, the most important being the placing of the device and the method of drive. These are closely related to each other; in fact, the location of the generator with reference to the other members of the power plant is largely governed by the method of operating chosen. Such appliances should be placed in as accessible position as possible, so the contact breaker and the distributor is handy for immediate inspection or adjustment. It should be placed on the inlet side of the engine and as far away from the carburetor as possible. When the design of the engine is such that the exhaust manifold is carried high, the magneto may be installed on that side of the motor. If placed too near the exhaust piping, the great heat is liable to injure the magnets and insulation of the windings. It should be attached firmly to a base of non-magnetic material by a strap or stirrup of similar substance, so that there will be no passage of magnetic lines of force except through the core of the armature shuttle.

Direct gear drive is to be preferred to chains and spur gears are to be advised in preference to worms or mitre members. The reason for the selection of a positive means of driving is that the spark must be timed to occur at a certain point in the engine cycle, and as the timing device is included in the magneto, if this were operated through some form of flexible drive, such as a belt, the spark time might vary within wide limits as permitted by the slip of the driving members on its pulleys. Then again, one should use as few gears as possible, as after a time the driving means may wear and the magneto will not be in absolute synchronism with the engine, thus reducing efficiency. As direct spur gearing with helical teeth is the best wearing method of power transmission, especially if well housed and properly lubricated, these are used whenever possible. Bevel gears are more satisfactory than either chain or worm drive. The less the number of gears in the train, the less the liability of backlash and lost motion through wear of the teeth.

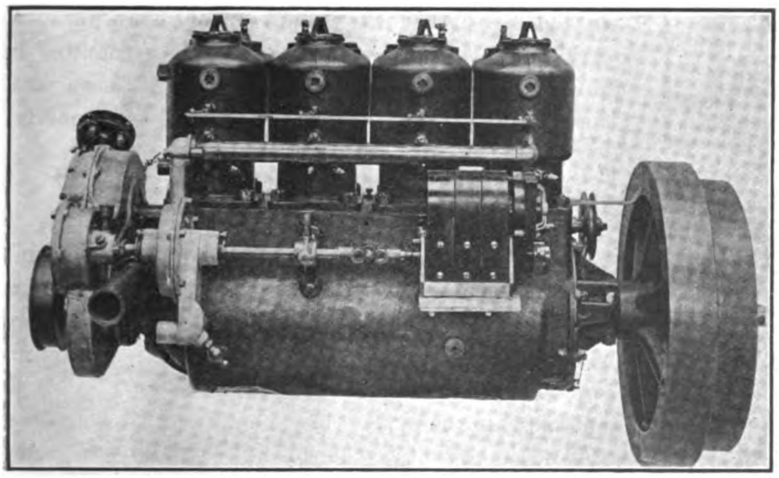

Fig. 42—Magneto Installation on Rambler Motors.

Magneto driving gears having 12 pitch teeth will be found strong enough to drive the armature without undue wear and this size is recommended rather than larger teeth because the greater the number of these in the engagement, the easier it is to time the armature accurately. When driven by shaft some form of Oldham coupling should be interposed between the armature driving end and the driving medium in order that any slight inaccuracies in the driving shaft will not impose undesirable stresses on the bearings by which the armature is supported.

Typical Methods of Magneto Mounting.

The location of the magneto and the methods of driving vary in nearly all automobiles, and, of course, the design of the engine has material bearing upon the placing of the igniter and wiring. The engine shown at Fig. 42 is one used on the Rambler. In this, the magneto is placed at the left side, between the third and fourth cylinders, and is bolted to a cast bracket attached to the engine base. The pump shaft is extended through the casing and is supported by a plain bearing near the forked member of the driving clutch. A similarly formed piece is attached to the magneto armature and the two are joined by a coupling member. Another example of driving by long shaft is shown at Fig. 43. In this case the magneto is applied to the engine used in the Regal automobile. Instead of being operated in connection with the pump as in the previous instance, as no pump is employed on the Regal motor, the magneto is driven by a gear the same size as that on the engine shaft, which is turned by the camshaft speed reduction member. The generator is supported on a bracket cast integral with the engine base and is retained by machine screws threaded in from the bottom.

(To Be Continued.)

CHEMICAL ACTION IN HIGH-TENSION WINDINGS.

The subject of chemical action in high-tension windings was discussed recently by a body of English engineers. It was found by experiment that none existed unless the voltage were higher than 3500, and then it occurred only where there were air pockets present. The action was initiated by a discharge across the air space, producing ozone and nitrous or nitric acid. This gas acting upon the insulating material, caused disintegration. Oils and gums of varnishes were oxidized, but asphaltum was not seriously attacked. Mica was not affected at all, but the gas injured the cement used. The tests showed that if the air in the pockets were not replaced the chemical action ceased.

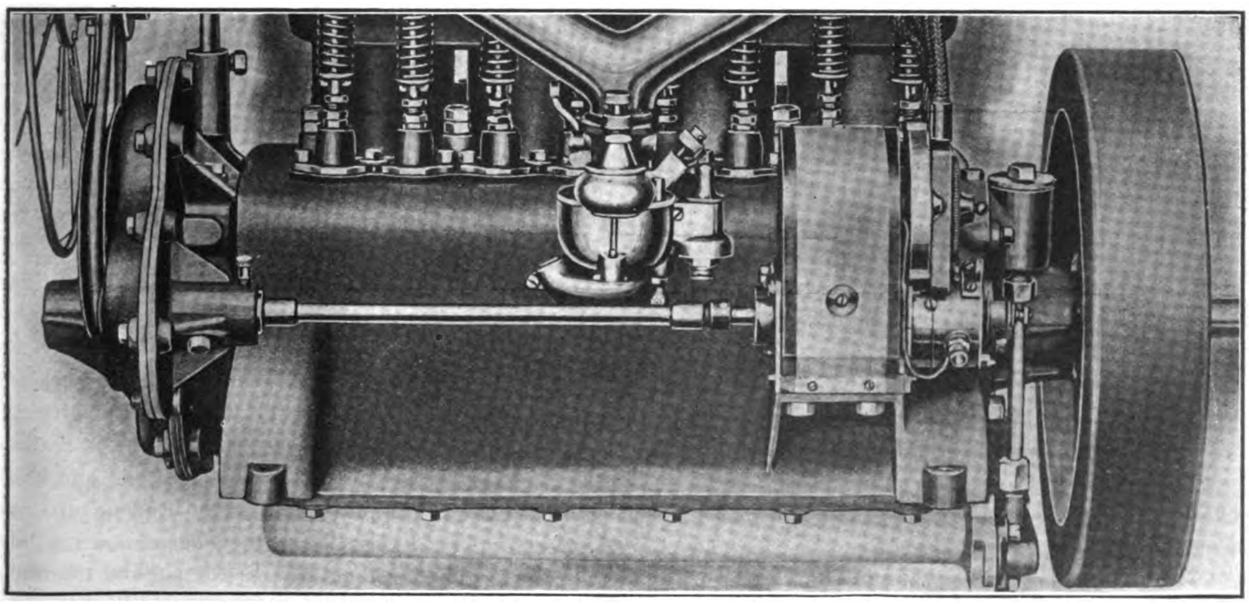

Fig. 43—How Magneto Is Placed on Regal Engines and Method of Driving This Instrument by Long Shaft.

THE ACCESSORY -AND- GARAGE JOURNAL
Devoted Exclusively to the Automobile Trade and Allied Interests

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SYSTEM IN GARAGE MANAGEMENT.

Attention to detail insures perfected work; the same policy applied to accounting makes certain the profit. Conducting a garage, or any other business, without a system is at parity with navigating without a compass. Any person can guess, and perhaps occasionally hit the mark. But the judgment of the wise man—wise because he knows—is respected. It is unusual for a man to engage in any work without knowing what his return will be, yet thousands enter business without having anything more certain than the traditional barn door ledger of the farmer. Accounting may appear a burden because it means record, but every leak is a loss for owner or manager. Such losses cannot be recovered. They are as beyond recovery as is yesterday. System is not a hardship. It is an insurance of profit, because work will not be undertaken that is not profitable. Its protection differentiates between success and failure. There are few men who would not gladly pay for a guarantee of business prosperity, yet many will reject a system, no matter how effective it may be, because they assume an added cost that will cause economy is an unnecessary expense. Some profess to believe accounting is only necessary when it is wanted. So it is, but a sane business man wants it always guarding his property.

PLANS FOR 1913 BUSINESS.

Without exception every concern engaged in manufacturing motor vehicles has made or is making its plans for the business of 1913. Many have already placed orders for material which will permit a considerable increase of production. It is not possible to approximate the proportion of industrial development. But it can be said that it will be very large with some concerns, notably those producing the popular or low priced pleasure cars, and practically every maker of service wagons is preparing to meet a demand that is estimated will be several hundred per cent. larger than this season. It is hardly necessary to state that this expectation of business, and every conclusion is based on reasonably certain information, will have its influence with every allied industry, with every firm in the trade, with every garage or public service station, and with every repairing shop. Without exception there will be expansion of facilities for manufacturing, for distributing, for selling and for care and maintenance, while the demands for service wagon attention will be relatively as large as the production of the factories. The outlook is unusually good and there are apparently no limitations to the possibilities for the industrial vehicle market.

OPPORTUNITIES FOR FOREIGN TRADE.

The opportunities for foreign business are such that every progressive manufacturer of either pleasure or industrial vehicles should seriously consider them. The fact that American machines have given excellent satisfaction wherever used abroad is one of the strongest arguments in their favor that can be made, because, after all, service is what is required. Vehicles made in this country have a relatively greater endurance in European use because of the decidedly better highways, and are really as cheap as here, despite the import duty, when measured by mileage travelled. The American automobiles have undoubted merit, and should be decidedly attractive to foreign buyers, but one of the greatest handicaps in the past has been the lack of branches to afford attention to customers and the length of time necessary to negotiate with the maker in the event of need. This has been realized by those who have investigated conditions and those who are exploiting the markets of Europe are prepared to give an attention to their customers that will at least equal that given by the English and Continental manufacturers.

GRAMM'S FUTURE PRODUCT.

B. A. Gramm, Designer, Gramm Motor Truck.

When announcement was made recently that John N. Willys, president of the Willys - Overland Company, Toledo, O., had purchased the controlling interest in the Gramm Motor Truck Company, Lima, O., it was stated that B. A. Gramm, who designed the Gramm truck and built up the business, would be associated with him in perfecting the details of the new organization. Mr. Gramm now explains that such was his original intention, but upon more mature reflection he has decided that this should prove an opportune time for him to bring out some new designs, which he believes will reflect the standard of the future in truck construction.

It is understood that Mr. Gramm has secured a new factory in Lima and that he has associated with himself a strong organization, which will proceed with plans for the production of new models. These are to be worked out thoroughly and given every test before being placed before the public. Beyond the bare information that the new trucks will be simple in design and construction, with few working parts, accessible in every detail and embodying features of comfort for the driver, absolutely nothing is known concerning them. Additional news concerning the factory and the product will be awaited with interest by those in the industry.

IMPORTANT MEETING CALLED.

A meeting of the directors of the United States Motor Company, New York City, selling organization for the Columbia, Maxwell, Stoddard-Dayton, Brush and Courier pleasure cars and Sampson trucks, has been called for the purpose of taking action on a proposition to issue $4,000,000 of five-year serial bonds, convertible into common stock at par and bearing six per cent. interest. These debentures would be a portion of the $6,500,000 still in the company's treasury out of the $12,500,000 authorized a year ago.

It is understood that the company is in need of working capital since it is necessary to finance the coming season's output before completely disposing of the 1912 product. An official of the company is authority for the statement that the concern is in better condition than at any other time in its history, insofar as the relative values of the assets and liabilities are to be considered. With the question of working capital settled, there seems reason for believing that the present difficulty will be entirely overcome.

INTERESTING DECISION.

The Massachusetts supreme court has made a decision in the case of Lauritz F. Rasmussen against Amos H. Whipple for the death of a newsboy from injuries alleged to have been inflicted by the defendant's automobile in Mattapan, April, 1907. The full court upholds the verdict of the lower court, giving $2000 to the plaintff. In its ruling, the court says:

"Every person operating a motor vehicle on our ways must run it at a rate of speed that is 'reasonable and proper, having regard to traffic and the use of the way and the safety of the public.' There was testimony that the signal horn was sounded, but it was not heard by a number of witnesses to the accident, and under the circumstances the jury could infer that it was not sounded loud enough or sufficiently near the place of the accident to give timely warning. Nor is it contended that even the loud blowing of a horn would give to the motor vehicle any exclusive right of way or relieve the driver from the duty of proceeding at a reasonable rate of speed and of keeping his car in control when approaching a busy thoroughfare."

REMY SALESMAN'S SUCCESS.

The accompanying illustration is that of A. J. Rogers, who was recently placed in charge of the Remy magneto branch at 170 Golden Gate avenue, San Francisco. His territory will include the entire Pacific Coast, and his success with the sale of Remy products in other capacities, is sufficient guarantee that the business of the concern in that district will show a marked increase at once.

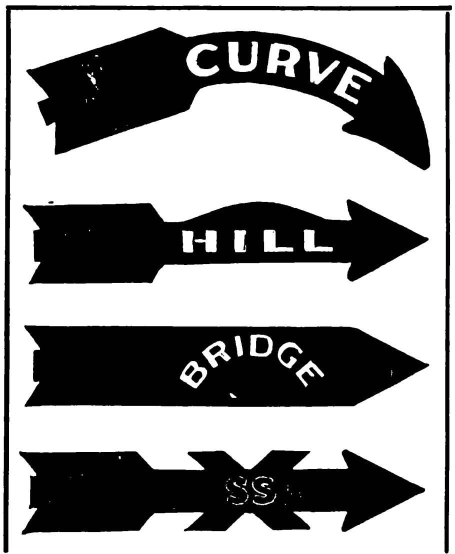
Mr. Rogers is well known through the Middle West and South, having been connected with the sales department of the Remy Electric Company, Anderson, Ind., for some time. Inasmuch as the home office is continually seeking men for the large number of factory branches and service stations it is establishing throughout the country, it follows that his work has been watched with interest by his superiors.

The San-Francisco branch is one of the most important in the country. The sale of Remy magnetos and other ignition and lighting equipment in this district has been increasing very rapidly of late and it was deemed best to select a man for branch manager, who had given ample demonstration of his ability. That Mr. Rogers measured fully up to this standard is a source of much gratification to his many friends, both in and out of the industry.

A. J. Rogers, Branch Manager, Remy Electric Company.

HARRIS OIL ROAD SIGNS.

A road posting campaign, which is bound to result in decided benefit to motorists and all others concerned, has been inaugurated by the A. W. Harris Oil Company of Providence, R. I., maker of the famous Harris oils for all forms of automobile, motorcycle, motor boat, and aeroplane lubrication. The plan is so unique that it merits more than usual mention. Some of the signs are presented herewith, but as they are handsomely lithographed in red, yellow and black, on substantial metal, these black and white reproductions hardly do them justice.



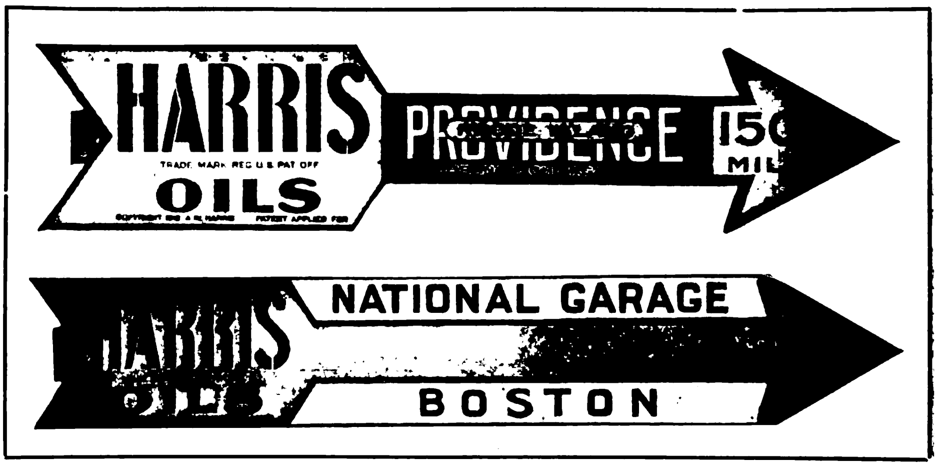
Harris Oil Signs—Symbol Arrows for Warning Motorists of Danger.

As will be noted the entire set includes master arrows, dealer's arrows and symbol arrows. The Harris company has applied for a patent and the signs are all copyrighted. The working of the plan is very simple.

The dealer's arrow, or as it is termed, the local wedge arrow, bears the dealer's name and the town with the mileage, and is designed for the purpose of informing motorists where supplies may be obtained. The master arrow gives directions and mileage to the larger towns and cities on the route, while the symbol arrows will prove of decided assistance to motorists in giving ample warning of approach to dangerous spots along the road. Inasmuch as all the signs are of long wearing material, the service will be permanent and of an enduring character.

This splendid advertising proposition is open to all dealers, the A. W. Harris Oil Company bearing the entire expense. Those dealers interested will be supplied with a sufficient number of signs to meet their requirements. The plan is decidedly comprehensive and should prove of material assistance to the motorist, the dealer and the Harris concern.

The arrows are now being sent out and the demand from dealers is growing rapidly. The reputation of Harris oils is well known, and it is anticipated that this new advertising plan will assist in bringing it to the attention of tourists. This is an exceptionally good time to begin the work of installing the signs along the roads travelled by motorists.



Harris Oil Signs: Above, Master Arrow; Below, Dealer's Arrow with Information as to Where Supplies May Be Secured.

NEW CONCERNS IN INDUSTRY.

Several new concerns have been organized for the purpose of constructing mechanical transports, and in one or two instances it is noted that well known wagon makers are taking up the manufacture of motor driven equipment. Among the latter may be mentioned the Geneva Wagon Company of Geneva, N. Y., which has held an enviable position in the older industry for a number of years. This concern will produce but one chassis, to which two types of bodies will be fitted, one having a capacity of 2100 pounds and the other 2300.

The F-S Motors Company has been organized in Milwaukee, Wis., for the production of a new light delivery car to be known as the F-S. It is understood that the backer is the Filer & Stowell Company of that city, which already owns a controlling interest in the Beaver Motor Company, the Petrel Motor Car Company, and other important concerns in that vicinity.

The Driggs-Seabury Ordnance Corporation, which is more or less well known through its connection with the parts industry, has been engaged in the construction of 20 motor trucks, which will soon make their preliminary tests. Three models will be produced, in capacities of three, four and seven tons, respectively.

A new concern has been organized in Clyde, O., to be known as the Krebs Motor Truck Company, for the purpose of manufacturing the Krebs truck of 1500 pounds capacity. It is understood that the motor will be a two-cylinder, two-cycle unit with bore of 4.5 inches and stroke of 5.5.

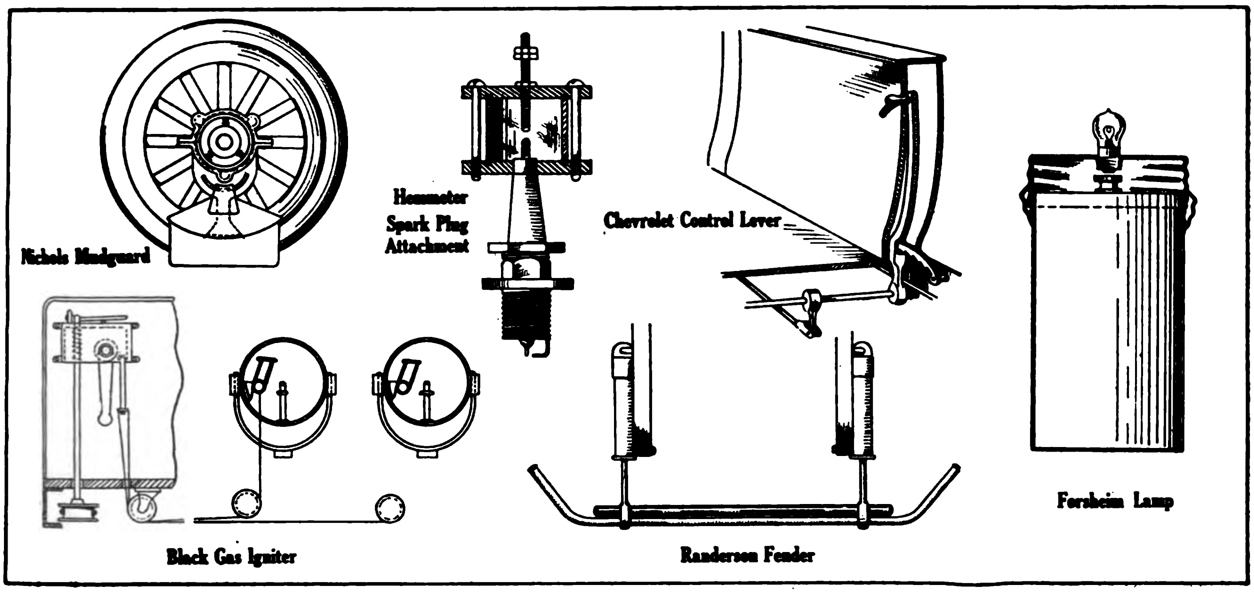
A. B. Perkins, his three sons, and G. E. Porter of Bay City, Mich., have organized the Wenonah Motor Truck Company, which will place in the market the Wenonah truck in two models, one of 1000 pounds and the other of 1500.

The Ewbank Power-Transmission & Motor Company, Portland, Ore., which was organized in December, is about ready to present its truck, and it is said that other products will include motor propelled fire apparatus and railway equipment. The basis of the new vehicle is a gasoline-electric traction system designed by H. B. Ewbank, Jr., which involves the use of separate driving motors for each rear wheel, speed control being accomplished through the regulation of the engine. The officers of the company are: President, S. M. Mears; vice president, George W. Stapleton; treasurer, R. S. Howard; secretary, Dr. H. B. Ewbank; chief engineer, E. H. Ewbank, Jr.

RECENT PATENTS of INTEREST

Hemmeter Spark Plug Attachment.

An attachment for a spark plug has been patented by Henry C. Hemmeter, Pontiac, Mich., assignor of one-half to Cassius C. Van Wagoner of the same place. It differs from the usual spark gap device inasmuch as it is attached to the plug itself and means are provided to prevent the spark from igniting any gasoline vapor which may be in the vicinity of the flame. The device comprises two circular plates of non-conducting material and these are recessed to take a glass tube. The parts are held securely by screws. The lower insulated plate is fitted over the binding nut of the electrode from which the terminal is removed in practise. The upper plate carries an adjustable threaded member and when a space is left between it and the regular electrode, the spark will jump across the gap. It is claimed by the inventor that the action of the current may be noted readily and that any soot or oil between the points of the spark plug will be removed by the device. Means are provided for fastening the attachment to the spark plug.



Outlining Some of the Recent Ideas of Inventors of Parts and Accessories Applicable to the Automobile, Including Control Lever, Fender, Electric Lamp and Gas Igniter.

Nichols Mud Guard.

There has been considerable agitation abroad regarding the splashing of mud upon pedestrians by the wheels of motor cars and the subject has received some attention in this country. Charles Hillyard Nichols, Wolverton, England, has patented a mud guard which is attached to the hub of the road wheels, this consisting of a ring having adjustable means incorporated and interposed between it and the hub of the wheel, also a method of retaining these in this position. A rotating ring is mounted upon the first and attached to this is a weight which keeps the guard in normal position. It is claimed by the inventor that any mud or water splashed by the wheel will strike the guard and be deflected inwardly toward the wheel.

Black Gas Igniter.

In these days of refinement considerable attention is being paid to devices which will control, light and extinguish acetylene headlights from the seat. Allen G. Black, Springfield, Mass., has patented a gas controlling and lighting apparatus for motor cars which is operated by a handle or lever convenient to the driver. The gas tank is fitted with a valve having a rotative stem and another similar wheel is attached near the front seat. These members are connected and operated by a cord. The latter is actuated by a lever or shaft by means of which the flow of acetylene is controlled. The lighting device consists of a spring wire, the middle portion of which is coiled, while its extremities are approximately parallel. These ends are fitted with means for igniting the gas, combustion taking place when one of the pivotally mounted legs is actuated. A retracting spring is provided to return the device into its normal position. The other leg is connected with the controlling mechanism and means are incorporated for operating the cord.

Chevrolet Control Lever.

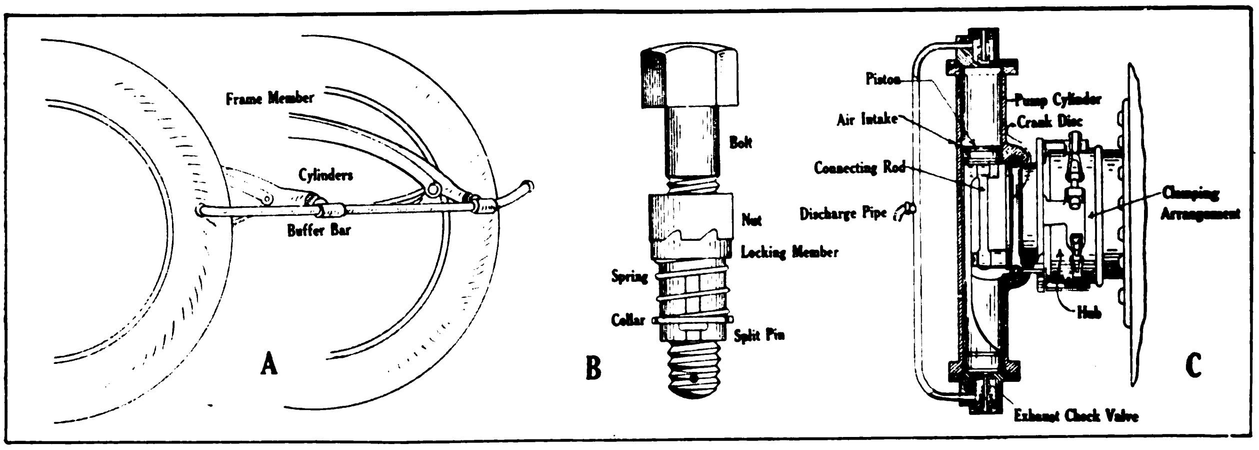
Louis Chevrolet and Etienne Planche, Detroit, assignors to the Chevrolet Motor Company of that city, have been granted a patent for a control lever which is unique in its location, inasmuch as only that portion grasped by the hand is in view. The device consists of a false door formed with an inner and outer wall in which space the control lever is concealed, as is the gate or quadrant. The lever is curved to conform with the shape of the fore door and is operated by means of a horizontal handle extending inwardly through a curved slot. It is claimed by the inventors that concealing the lever not only improves the appearance of the car but inside control is obtained without interfering with the comfort of the operator or occupant of the other front seat. It is also pointed out that the member is less likely to be tampered with when the machine is left unattended on the street.

Randerson Fender.

Letters patent have been granted to John P. Randerson, Albany, N. Y., for an automobile fender in which is incorporated means for not only resisting the shock of compact but taking care of the recoil. Two fender bars are utilized, these being similar in construction to the usual devices of this nature. These rods are supported by hinged members, extensions of which are fitted to tubes containing cushioning springs. The spring carrying members are fastened to the vehicle. When the fender comes in contact with an object it is claimed by the inventor that the springs absorb the shock and eliminate any danger from recoil.

Forsheim Electric Lamp.

Joseph Forsheim, New York City, has been granted a patent for an attachment to a dry cell which presents practical features, inasmuch as the device is simple and attached easily. It consists of a cap or casing having spring like retaining arms and so arranged that the terminals of the positive and negative poles come in contact with similar members of the device. Means are also incorporated whereby the supply of current may be cut off as desired. The electric bulb is screwed into the top of the casing and when the components are assembled the dry cell may be utilized for an inspection lamp and for other purposes as well. The inventor points out that with his device a motorist may utilize one or all of the dry cells in the car for lighting purposes whereas with the ordinary inspection lamp with battery self-contained, the service is limited.



Novel Inventions of Interest to Those Identified with Motoring.

NOVELTIES AND ODDITIES IN INVENTION.

Among the recent inventions for which patents have been allowed there are a number of distinct interest to motorists. The device in sketch, at A, is a vehicle fender in which the buffer rod is provided with pistons sliding in special cylinders intended to fit over the front frame members. This is an advantage over the usual manner of installation, which calls for a removal of the spring supporting bolts to install the conventional type of fender. The fender is carried higher than in the ordinary applications, the springs may be made larger and stronger, the device is neater and the thrust is taken at a point well adapted to resist it, the point of juncture of both spring and frame member. Oscar C. Graff of Chicago, Ill., is the inventor.

A Nut Lock of Merit.

The nut lock shown at B is slightly more complicated than the simpler forms of spring washer or castellated nut, but should prove useful in many applications. The nut is provided with a number of serrations adapted to engage with the corresponding set on the locking member. This is a slotted cylinder sliding over the thread of the bolt, being kept from turning by a pin passing through the bolt and slot. The tension of a coil spring between a collar held by the pin and the locking member keeps the teeth always in engagement with those of the nut and prevents this member backing off. If one desires to screw the nut up, however, it may be done in the usual manner with a wrench, the teeth of the locking member limiting movement in but one direction. The disadvantage of this construction is that a bolt must be longer than with either a castellated nut or spring washer, though not much longer than if a nut and check nut are employed. This locking arrangement has been devised by Burton D. Lodge, Magnolia, Del.

Tire Pumping Attachment for Wheel Hubs.

A novel tire pumping attachment for automobiles has been devised by Oscar M. Bergstrom, Minneapolis, Minn. This consists of a cylinder having a discharge check valve at either end, these being coupled to a common lead, in which a double piston is operated by a crank. The latter is turned by a fitting intended to be temporarily attached to one of the driving wheel hubs. The cylinder is mounted on a flange which runs on ball bearings and is held rigid while the wheel is turned. Air enters the cylinder through the ports uncovered by the piston at the bottom of its stroke, and is compressed and discharged through the air valve in the cylinder head. The driving flange is provided with a series of flexible arms, with a chain and screw clamping arrangement, so it will fit a variety of hub caps without change. The method of application and the parts of the device are clearly shown in illustration, at C.

ANNEALING BOX FOR SMALL PARTS.

An annealing box for small parts can be made easily in the following manner: Take a piece of three-inch iron pipe about 10 inches long, tap both ends and fit plugs. One end of the tube is closed and the charcoal and parts to be annealed are packed in, after which the other plug is screwed in. With a box of this kind sealing is not necessary, as the screw plugs will prevent the entrance of air.

When a paper gasket will not prevent oil or grease from leaking, owing to the edges of the case being sprung, a paste composed of litharge (fused oxide of lead) and glycerine will fill the space and stop it. This mixture is often used in the pipe joints of underground gasoline systems.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

FORD IGNITION AND ADJUSTMENT.

It is surprising to note the large number of owners of the model T Ford who fail to obtain the maximum efficiency from the motor because of a lack of practical working knowledge of the ignition system and an inability to adjust the coil properly. The writer has noted from time to time, that many new operators, and even some with experience, rely upon the agent or salesman to tune up the coil, a task that may be performed by the owner if he understands its principle and application in practise. Frequently the failure of the car to operate smoothly is due to one or more of the coil units not being synchronized with the others, or to causes which will be outlined herein. In order to overcome ignition troubles the driver should understand the operation of the system which will be explained in non-technical language for the benefit of the novice.

Operation of Motor.

The explosive mixture is introduced into the cylinder by the suction of the piston when the latter is moving downward, a movement known as the intake stroke. The next half-turn of the crankshaft carries the piston upward, compressing the gas. This is the compression stroke. The remaining two strokes are firing, a downward movement, and exhaust, an upward stroke of the piston. Those strokes should be borne in mind as they are important in timing the ignition should it be necessary to remove the commutator.

Two valves are fitted to each cylinder, an intake and an exhaust. The former is located easily, being that member in line with the spark plug. The intake valve begins to lift when the piston is moving downward on the intake stroke, and remains open until the movement is nearly completed, and is closed during the succeeding, or compression stroke. The exhaust begins to open slightly before the power stroke is completed.

The cylinders fire 1, 2, 4, 3, and when the piston of the No. 1 cylinder is at the top of its stroke, those of the Nos. 2 and 3 are at the bottom while the No. 4 is at the top. In order to facilitate resetting the timer, the firing order and opening of the valves will have to be considered; that is, if the ignition is not timed by the piston, and the following table, giving the strokes of each cylinder in their respective order, will be of value:

Order of Firing.

Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
1—Firing	Compressing	Exhausting	Intaking
2—Exhausting	Firing	Intaking	Compressing
3—Intaking	Exhausting	Compressing	Firing
4—Compressing	Intaking	Firing	Exhausting

When the piston of the No. 1 cylinder is at or near the top of the compression stroke, a spark is supposed to take place at the gap of the spark plug, igniting the mixture, producing a pressure against the piston and driving it downward. At the same time the piston of the No. 2 cylinder moves upward on its compression stroke. No. 4 cylinder is drawing in a charge, while the No. 3 is exhausting, as will be noted by the table.

A separate and distinct spark takes place in each cylinder in the following order, 1, 2, 4, 3. This is accomplished by a device known as the timer or commutator which is attached to the shaft operating the valves. This timer has four insulated terminals, each corresponding to the same numbered cylinder. The interior of the timer is fitted with a fibre ring, a non-conductor of electricity. Inserted in the fibre, 90 degrees apart, are metal blocks, the surfaces of which are flush with the fibre.

Attached to the camshaft is an arm carrying a roller, and both of these members rotate at camshaft speed, which is one-half that of the crankshaft. The timer proper is loosely mounted and may be moved in either direction for advancing or retarding the spark. It may be compared to a switch in an electric bell system. When the metal roller comes in contact with a metal block in the fibre, the primary circuit is closed and current will flow, but the connection will be broken when the roller comes in contact with the fibre. The roller rotates to the left, when facing the radiator, and makes contact with blocks, 1, 2, 4, 3, respectively, the firing order of the cylinders.

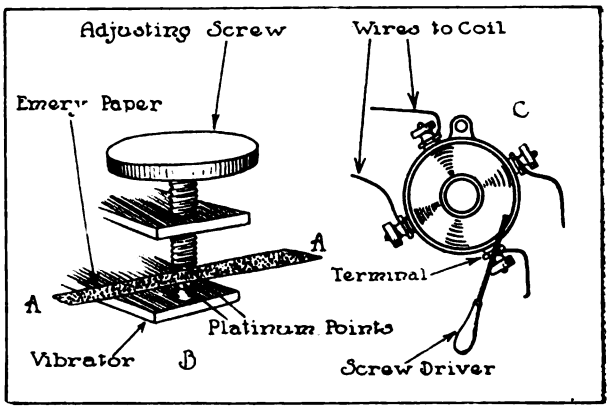


Fig. 1—Ignition Hints: B, Cleaning and Truing Coil Points with Emery Paper; C, Method of Testing Primary or Secondary Current with Screw Driver.

Function of Coil.

The magneto develops a low-tension current, and this electricity is built up or strengthened to force the current to jump across the gap of the spark plug. This is accomplished by the windings in the coil, a primary and a secondary, of coarse and fine wire, respectively. On the top of each unit of the coil is a flat strip of metal carrying a platinum point and directly over a core of iron wires. An adjusting screw is also fitted with a platinum point in contact with the other member. The coil also carries a switch which closes the magneto or battery circuit. It is explained that for electricity to flow a path must be provided for it to leave its source of supply, as well as one for returning. With the motor car but one wire is necessary as the metal of the frame, etc., is utilized as one lead and is known as the ground.

Direction of Current.

When the lever of the switch coil is thrown to "magneto," and the latter is operating, current is being developed, and a circuit is completed when a contact is made at the timer by the roller. The electricity then flows through the No. 1 wire, for example, on the timer. This wire is insulated and the current travels to the No. 1 unit of the coil where it is built up into a high-tension.

The vibrator is drawn down by the iron core or magnet, breaking the circuit, and for each contact of the platinum points a spark is produced at the gap of the plug. This secondary or built-up current is led from the coil by a heavy insulated wire to prevent leakage, and in reaching the plug passes down the metal electrode, which is insulated from the base of the plug and jumps across the gap to the shell. The latter being of metal and in contact with the cylinder, a return path is provided for the current by the way of ground or metal back to the generator or battery. Thus it will be noted that there are two circuits, a primary and a secondary.

Wiring Diagram.

The arrangement of the components of the ignition system is depicted at Fig. 2 A, which also outlines the timer. The sketch shows the connections of the coil on the back of the dash and it will be noted that these are numbered 1, 2, 3, 4, both for the primary and secondary wires. The leads to the plugs are similarly marked. It will be seen that the 1, 2 and 3 wires from the timer lead to the corresponding terminals of the coil, but that the third contact to be made at the timer is connected to the No. 4 terminal of the coil, this arrangement being necessary to bring about the firing order, 1, 2, 4, 3, as previously explained. The fact that No. 4 cylinder fires ahead of the No. 3 is confusing to the amateur in locating troubles and when it becomes necessary to rewire the timer.

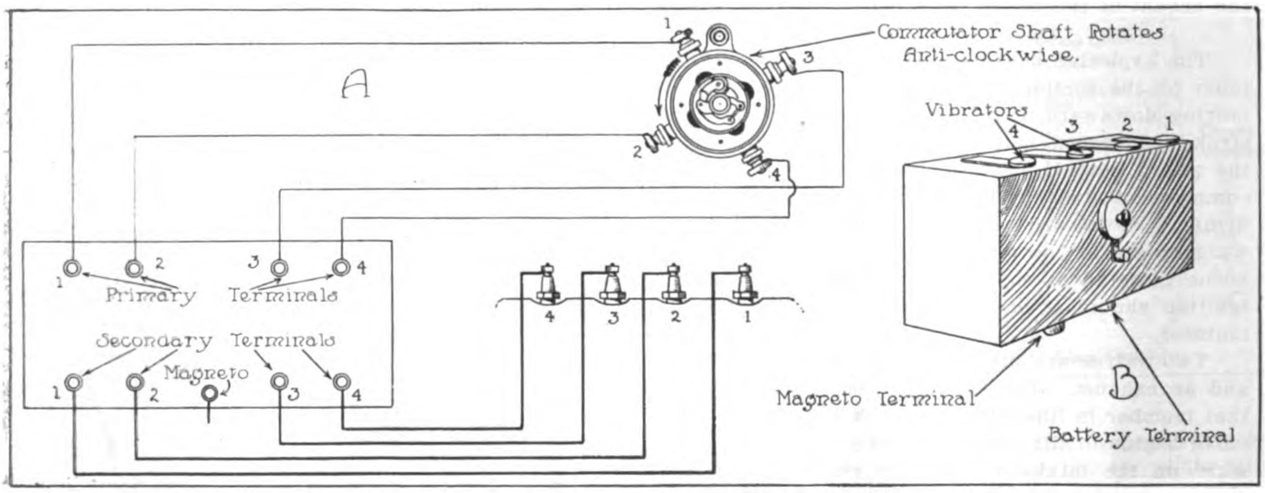


Fig. 2—Outlining Ignition System of Model T Ford: A, Showing Primary and Secondary Leads; B, Depicting Vibrators of Coil Corresponding to Numbered Spark Plugs.

Locating Missing Cylinders.

There are several practical methods of locating which cylinder is missing explosions. The coil may be utilized and B shows the vibrators, these being numbered 1, 2, 3, 4, corresponding to the plugs in the cylinders. The cylinder nearest the radiator is designated as the No. 1. By holding down with the fingers, vibrators, 4, 3, 2, with motor running, current will be cut off to all cylinders except the No. 1, and if the plug or coil be at fault the motor will stop. The other cylinders may be tested in a similar manner. If upon screwing down the adjusting member, the vibrator buzzes, the fault is likely to be due to the plug which may be examined and replaced by a new one if necessary.

Another method is to short circuit the plug with a screw driver, taking care to utilize a tool having an all wood handle, else one is likely to receive a shock. The metal of the instrument is used to make a connection between the cable terminal and some convenient metal of the motor. This should be done with the cut-out open so as to note by ear the explosions. The spark may be tested in a similar manner by holding the point of the screw driver about .25 or .5 inch away from the cylinders with the other part of the tool in contact with the cable terminal. Still another method, which is more troublesome, however, is to loosen the binding nuts of the spark plugs and take one wire at the time, holding it near metal and noting if a spark jumps the gap. Each wire may be tested in a similar manner.

Testing with Dry Cells.

When the car is equipped with a set of dry cells, the locating of ignition troubles is somewhat easier because there is a constant supply of current with the motor inoperative. Each plug may be examined by turning the motor until a contact is made at the timer for the cylinder in question and with the plugs out and laid on the cylinders, the condition of the spark may be ascertained easily. Care should be exercised to see that only the shell of the plug comes in contact with the metal and not the terminal or exposed portion of the wire.

A simple way of making the contact at the timer is to utilize a screw driver as depicted at Fig. 1 C. This makes a connection similar to that by the roller and contact members. If the coil buzzes with the motor idle, turn starting handle slightly to break contact at timer. The coil may also be tuned by connecting a wire to any metal of the car and placing the other end on the primary connection of the coil and adjusting the screw.

Adjusting Coil.

The coil is adjusted by turning down or up the screw member and when the cylinder does not fire evenly and strongly the screw should be turned down slightly until the explosion is snappy. The contact should be light—just enough to bring about the desired explosion at slow speeds for the voltage of the magneto increases with the speed of the car. The coil should always be adjusted at low speeds. Too severe contact will result in burning the platinum and when this condition exists considerably more current is utilized as the burnt metal sets up resistance.

It is poor policy to use a file to clean these points which require attention from time to time. It is not essential to remove the screw or vibrator for this work and at Fig. 1 is shown a simple method of cleaning and truing the points by the use of the finest emery paper. A narrow strip is utilized and placed between the point adjusted so that they just grip the paper. The latter is then grasped at A A and moved back and forth, taking care to keep the paper in a horizontal position. The paper is then reversed and the lower point treated, after which the unit is adjusted. This saves removing the parts, a task the novice should not attempt.

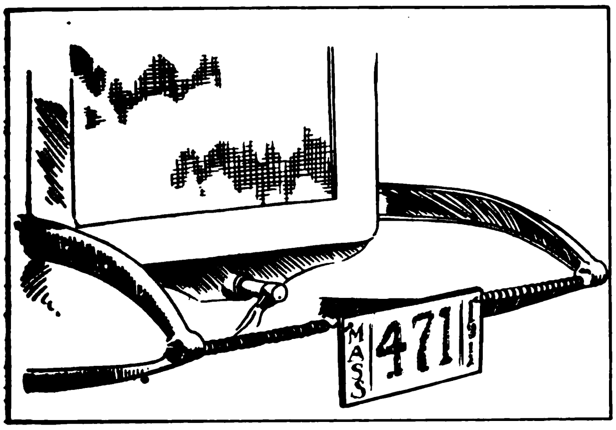


Fig. 3—How License Plate May Be Suspended by Coiled Springs.

Wiring Troubles.

The wiring system of the car is very simple and should the wires become broken or removed, they may be replaced easily by following the wiring diagram outlined at Fig. 2. Should it become necessary to rewire the timer the operation will be simplified by noting that the roller and block of the No. 1 terminal are in contact as shown in the drawing. The replacing of the remaining leads will be an easy matter.

If the timer be removed, and the motor cranked by accident so as to change the position of the rotating camshaft, the ignition will have to be retimed. Several ways are suggested but a simple method is to bring the No. 1 cylinder up on the compression stroke, remove plug and insert finger, noting if the piston is at the top of the stroke, or dead centre. The timer is then replaced with contact being made by the No. 1 block of the timer with the roller. This is the member at the left of the portion to which the lead rod connection is attached. The No. 2 is the next to the left and so on.

The correctness of the leads may be ascertained readily by testing with a screw driver if batteries are installed in the car. From time to time the commutator should be washed out with gasoline or kerosene and refilled with a fresh lubricant. If by accident any one of the primary wires to the member should become broken within the carrying cable, it can be located by the same test as conducted with the screw driver. By keeping the contact points of the coil clean and adjusted properly the car will run smoothly and sweetly, developing its maximum efficiency provided the other components of the power plant are performing their proper function.

CLEANING GLASS OIL GAUGES.

Many oiling systems of the motor car include a tube-like gauge of glass which is utilized to denote the amount of lubricant being fed by the system or the quantity in the container. Where these members are exposed they accumulate dust and dirt, making it difficult to note at a glance whether the oil be dropping or the amount registering.

Many owners of the model T Ford fit a gauge to the crankcase and as it is exposed, it collects dirt. While the centre may be cleaned easily the lower portion is more difficult. At Fig. 4 A is presented a suggestion for removing foreign elements when a cloth fails. It consists of taking a coarse, soft string and making a couple of turns around the glass, drawing one end of the twine and then the other, imparting a sawing motion as outlined in the sketch. If the string be soaked in gasoline, the incrusted deposits will be removed easily.

Where sight feeds are fitted to the dash such as shown at B, it is impossible to get back of these members with a cloth when cleaning. The string kink may be utilized, employing a piece of fine wire attached to one end of the twine to enable the material to be passed around the tube.

MARKING STEELS FOR STOCK ROOM.

System in the stock room is a valuable asset to the repairman. Various grades of steel are required and it is a good idea to adopt a method of marking each separate brand so that the workmen will be able to recognize them without the fire and water test. The best way to insure against difficulty arising from mistakes in using the wrong brand of steel is to have each brand or grade striped with a different color paint. An index board bearing the colors of the steel, can be made and hung on the rack containing the steel. In this manner the brand of steel desired can be found in a moment with the certainty that it will be right.

SUSPENSION OF LICENSE PLATES.

In most states the law requires the display of two license tags, one at the front and the other at the rear. Some motorists object to drilling the metal body or fender for fastening the rear number and although devices are made for securing the tag to the tail light bracket these involve expense. A simple and inexpensive method of suspending number plates is depicted at Fig. 3 and as will be noted, consists of two spiral springs one end of which is hooked into the number tag and the other extremity secured to the spring bolts. The springs should be substantial and considerably shorter than the distance between the frame so that the plate will be held securely and prevented from swinging.

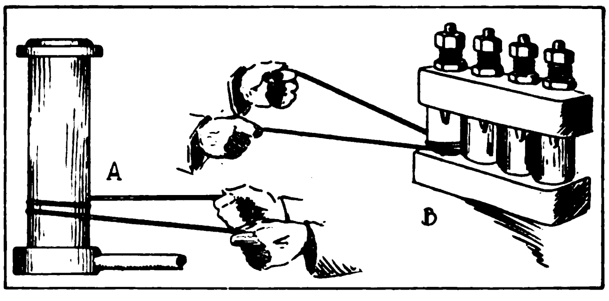


Fig. 4—Method of Cleaning Glass Oil Gauge Tubes with String.

MAKES COLE A SUCCESS.

The remarkable success of the Cole Motor Car Company, Indianapolis, Ind., makes it interesting to consider for a moment the personality of the man behind the institution. President J. J. Cole, whose photograph is presented herewith, has been identified with the manufacture of Cole cars since the inception of the company. Heretofore, he has delegated the selling end of the business to others, devoting his entire time and attention to the production of cars, and as a result the various Cole models have represented the best that J. J. Cole was able to put into them.

J. J. Cole, President Cole Motor Car Company.

He is a modest man, little given to discussing the part he has played in the development of a successful business. The secret of his plan appears to have been the concentration of effort. During the period necessary for building up a business of this magnitude, it was his idea that a separation of the manufacturing and selling ends would result in permitting each employee to give better attention and more time to his individual duties. The wisdom of this suggestion is found in the splendid foundation of the Cole selling organization, backed by a coterie of Cole distributors and agents, which is hard to equal.

Under the new arrangement, which will go into effect July 1, the Cole Motor Car Company is to take over the sales branch, heretofore conducted under the name of the Henderson Motor Sales Company, but it will retain its individuality as before. President Cole will continue to devote his time and attention to manufacture, while the sales end will be in charge of Charles P. Henderson, as sales manager.

PEERLESS COMPANY EXPANDS.

Because of the recent growth of the company's business the Peerless Motor Car Company, Cleveland, O., maker of Peerless pleasure and commercial lines, recently offered for sale to its stockholders only, $300,000 of additional capital stock, which was largely over-subscribed. It also has sold its six per cent. bonds in the amount of $1,100,000, these maturing in installments covering a period of 12 years.

It is understood that the sale of bonds was for the purpose of providing funds for developing and extending the business, particularly to meet the requirements of the commercial vehicle department. The additional capital stock provided money with which to take up the company's floating indebtedness.

FIRST OKLAHOMA FACTORY.

The first automobile factory in the State of Oklahoma is to be built in Oklahoma City by W. E. Nation, who hopes to be producing pleasure and commercial cars within the next three months. A company will be organized with capital of $50,000, and the proposed plant is to have floor space of 12,000 square feet.

Mr. Nation is proprietor of one of the largest retail harness and vehicle companies between Kansas City and the Gulf of Mexico, besides being a member of the Oklahoma City Chamber of Commerce and vice president of the Retail Dealers' Association. For a number of years he and his sons have been spending their summer vacations visiting some of the largest automobile concerns in the country and studying manufacturing methods.

Little is known concerning the new product, but it is understood that it will embody a number of distinctive features, which have been the subject of recent patents granted to Mr. Nation. These are expected to work for economy of maintenance and upkeep, and to prove of decided interest to those who desire a machine adapted for use on the sandy areas of the Far West.

TO SELL OVERLANDS ABROAD.

Claude A. George has been selected by President John N. Willys of the Willys-Overland Company, Toledo, O., to represent the maker of Overland cars abroad in the establishment of an European depot at Hamburg, Germany. The choice is one which will meet with favor by a large number of people both in and out of the industry, who are well acquainted with Mr. George and his particular fitness for the commission.

Claude A. George, Foreign Manager, Willys-Overland Company.

His connection with the industry has been such as to command widespread attention, having been assistant sales manager of the Willys-Overland Company for several years. Previous to his connection with that concern he was an European representative of the Eastman Kodak Company, so that his field in this new work is by no means unknown by him.

The foreign business of the Overland has grown so fast during the last year that this move was regarded as absolutely essential. Several agencies are maintained all over the Continent, as well as on the British Isles, and the Overland product has come to be recognized as particularly adapted for the foreign market. The future success of the enterprise will depend largely upon Mr. George, and his many friends will agree with President Willys in believing that he will meet the opportunity.

WITH OLDSMOBILE IN BOSTON.

Among the factory branch managers in Boston there is none better known than William B. Fewell, who is in charge of the New England division of the business of the Olds Motor Works, located at Massachusetts avenue and Newbury street. Mr. Fewell has been identified with the motor vehicle industry for years and is regarded as one of the "old timers" so far as length of service is concerned. He is a native of Springfield, Mass., and gained his motor knowledge with the Locomobile Company of America, being connected with that concern for a number of years. He then went to the Olds Motor Works and was located in St. Louis Mo., as manager of the branch of the company, being transferred to Boston to succeed George Houck. With the Locomobile Company Mr. Fewell was a travelling representative and as such was brought in contact with thousands engaged in the trade and industry, and as a branch manager he has become known to an exceedingly wide circle of friends. The Olds Motor Works branch will later on be housed in a fine service station now building in Commonwealth avenue, to which, when completed, the present service station at Cambridge will be moved.

William B. Fewell, Manager Boston Oldsmobile Branch.

WISCONSIN CENSUS REPORT.

The census figures for Wisconsin show that the industry in that state practically has been developed since 1899. In 1904 there were six establishments, and in 1909 there were 30. The growth of the industry is shown by the following:

	1904		1909	
	No.	Value	No.	Value
Pleasure cars	2378	$1,846,294	5559	$7,050,862
Commercial cars	12	10,400	32	34,700
Totals	2390	$1,856,694	5591	$7,085,562

Other detailed information is included in the following table:

	1904	1909
Number of establishments	6	30
Persons engaged	587	4647
Proprietors	8	18
Salaried employees	59	331
Wage earners	520	4298
Primary horsepower	645	3153
Capital invested	$1,240,000	$8,746,000
Salaries paid	54,000	443,000
Wages paid	300,000	2,733,000
Cost of materials	845,000	5,340,000
Value of products	1,875,000	11,440,000
Value added by manufacture	1,030,000	6,100,000

WANT LENOX FACTORY.

Recently, H. E. Holbrook of Stoughton, Mass., representing several citizens of that town, called upon the officials of the Lenox Motor Car Company, Boston, maker of the Lenox car, for the purpose of laying a proposition before them, looking toward the location of a plant in Stoughton. That the town appears to be in earnest in seeking the company is gleaned from the fact that the offer includes the gift of sufficient land beside the railroad track, and the erection of a brick factory at a cost of $40,000, the company to pay for the factory at the rate of $5000 a year without interest.

The Lenox car first made its appearance in the market during the Boston show of 1911, and since that time has enjoyed an enviable sale throughout New England and the East. Plans have been under way for an enlarged production during 1912. Evidently the people of Stoughton share the optimistic view of the Lenox officials and are anxious to secure this rapidly growing business for their own.

NOW WITH BAKER ELECTRICS.

An important announcement is made in the information that H. A. Worman, formerly advertising manager of the National Carbon Company of Cleveland, O., has become identified in the same capacity with the Baker Motor Vehicle Company of that city, maker of Baker electric pleasure and commercial cars. Mr. Worman is recognized as an authority on advertising and selling, frequent articles from his pen having appeared in magazines devoted to constructive work along these lines.

After leaving college, he associated himself for a period of five years with the National Cash Register Company, Dayton, O., obtaining valuable experience, which has been combined with his own natural aptitude for this field of endeavor. Later he became identified with the Addressograph and International Harvester companies of Chicago.

Since removing to Cleveland, Mr. Worman has been actively interested in the development of classes in sales and advertising methods in connection with the Y. M. C. A. schools. He is regarded as a convincing lecturer and writer upon the subject of his profession and the Baker Motor Vehicle Company is to be congratulated upon securing his services.

H. A. Worman, Advertising Manager, Baker Motor Vehicle Company.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Fitting Auxiliary Oiler.

(72)—I have a ——— car which gives excellent service but believing in using plenty of oil am writing for advice upon the installation of an auxiliary oiler. The oiling system of the machine is splash and the lubricant is poured in through an opening in the crankcase. After running about 50 miles the gauge does not show enough oil to suit me. I frequently take long trips and have to stop to replenish the oil. Is there not some way I can supply the oil without leaving the seat?

OSCAR L. MERTON.

Canton, O., May 29.

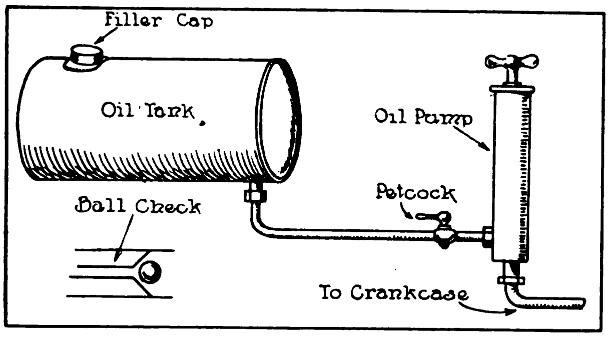


Fig. 1—Auxiliary Oiler for Pumping Lubricant to Crankcase of Motor.

While it is an excellent idea to use enough oil too much results in the car smoking and creating trouble with the spark plugs as well as causing carbon. The writer knows of several machines of the make referred to and their owners have not experienced any trouble as they follow the direction of the maker. A force feed or mechanical oiler may be installed and the Pedersen Lubricator Company, New York City, makes a device adapted for this machine. It pumps the oil in proportion to the speed of the motor, is attached easily and is not expensive.

At Fig. 1 is presented a suggestion for pumping oil as desired to the crankcase. It consists of an oil tank, metal tubing, a petcock and an oil pump. The tank may be mounted inside the dash and should be higher than the pump to obtain a flow of lubricant to the latter by gravity. A pump may be secured having a petcock or the latter inserted in the line as shown in the drawing. To utilize the device, the petcock is opened and the pump handle pulled up, which will take in a charge of oil. The petcock is then closed and the handle depressed which will force the lubricant to the crankcase. As the pump is made in several sizes and stated capacities, the amount of oil pumped to the crankcase could be computed easily.

If it is not convenient to mount the oil reservoir above the pump, the former may be attached to the side of the car and ball checks employed, these being so fitted as to allow oil to be drawn into the pump in the direction as denoted by the arrow in the illustration. When the pump handle is depressed the ball will be forced against its seat preventing the lubricant from returning to the reservoir.

Storage Battery Plates.

(73)—Being a subscriber of your magazine I would like to be informed regarding the Faure type of storage battery plates utilized for electric lighting of the motor car. What I wish to ascertain is whether the active material, oxide of lead, applied in a paste form is the same for both the negative and positive plates, and how these members may be distinguished.

J. WALLER.

Brooklyn, N. Y., May 14.

In the Faure or pasted type the lead plates are coated with minium or litharge made into a paste with acidulated water. When the material is dry these plates are placed in a bath of diluted sulphuric acid and subjected to the action of a current, by which the oxide on the positive plate is converted into peroxide, and that on the negative reduced to finely divided or porous lead. The positive plate may be distinguished easily by its color, being a brown or a chocolate. The negative is a light gray. Ignition batteries are not practical for electric lighting because of their low discharge rate. A lighting battery, however, may be utilized for ignition purposes.

Slipping Clutch.

(74)—I have a model 38 Overland which I have operated less than 3000 miles. I cannot tighten the high speed clutch any more. It continually slips, and the pedal won't stay in high. It is the planetary type transmission. Could you inform me how to remedy it? Would it take an expert to replace a part that might be causing the trouble?

GEORGE S. MARSHALL.

Basehor, Kan., May 12.

The slipping of the clutch is due to operating with the member improperly adjusted and the wear to a lack of lubricant. The best method would be to disassemble the transmission and examine each part carefully. A new plate probably will be required, but this may be determined by inspection. Unless one is familiar with the work it is best to have the repair attended to by a capable repairman. If there is an Overland agent convenient he will be able to locate the trouble and give an estimate as to the cost of the repair.

Acetylene Mixture.

(75)—I understand from the correspondence column of your most valuable Journal that acetylene absorbed by gasoline gives a more powerful explosive mixture than gasoline alone. I would consider it a very great favor if you will inform me of a simple method of obtaining this mixture.

LOUIS ENGEL, JR.

Philadelphia, Penn., May 18.

Regarding the mixing of acetylene and gasoline the article dealt with probable dangers of the two products uniting or mixing with air in a closed room, or a garage, and being ignited by a flame. A certain authority holds that such a mixture would produce a more powerful explosion than a gasoline vapor.

As far as the writer can ascertain a mixture of acetylene and gasoline is not utilized although it was stated in the article that the former could be carbureted; that is, mixed with air in a special device and transferred to the combustion chamber in the usual manner. In some self-starting devices it is claimed that the engine may be operated by the equipment until the supply from the tank becomes exhausted.

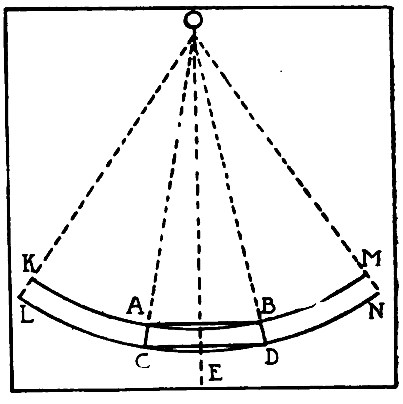


Fig. 2—Working Diagram for Cutting Lining for Cone Clutch.

The proper acetylene mixture is 10 parts of air and one of the gas. This is brought about by a mixing valve incorporated between the tank and cylinders. There are several upon the market which perform this function automatically. While by experimentation one of these members could be made it would be better to purchase one, as considerable time and expense would be saved in the installation.

Relining Cone Clutch.

(76)—As a new subscriber to your valuable publication, would ask if you will kindly assist me by giving any information you may possess concerning the following: I purchased a second hand machine and am having trouble with the cone clutch. The repairman informs me that it requires a new lining because the old one is worn out. Would like to do this work to save expense of repair bills. NEW OWNER.

Portland, Me., May 17.

The simplest way of releathering the clutch is to remove the old member and utilize it as a pattern. When this is not possible the following method may be employed: Take a large sheet of paper and draw a side elevation of the clutch cone as outlined at Fig. 2, A, B, C, D. Produce the lines A—C and B—D, until they meet at the point O. Next draw the centre line O—E. With the centre O and radius O—C, describe an arc L—N, and with radius O—A, describe another arc K—M.

Next, measure the largest circumference of the cone. For example: Suppose the circumference of the cone to be 60 inches. On a pair of dividers take a distance a small fraction of this, say one inch. From the point E where O—E cuts the larger arc, lay off round the arc this dimension 30 times in the same direction. This will give the point L. With the centre E and radius E—L mark off the point N. Join L and N to centre O. Then K, L, M, N will be a figure the same shape and dimensions as to be cut. Cut out of the paper the figure K, L, M, N, and use as a pattern from which to cut the leather. This pattern can then be marked and utilized when necessary in the future.

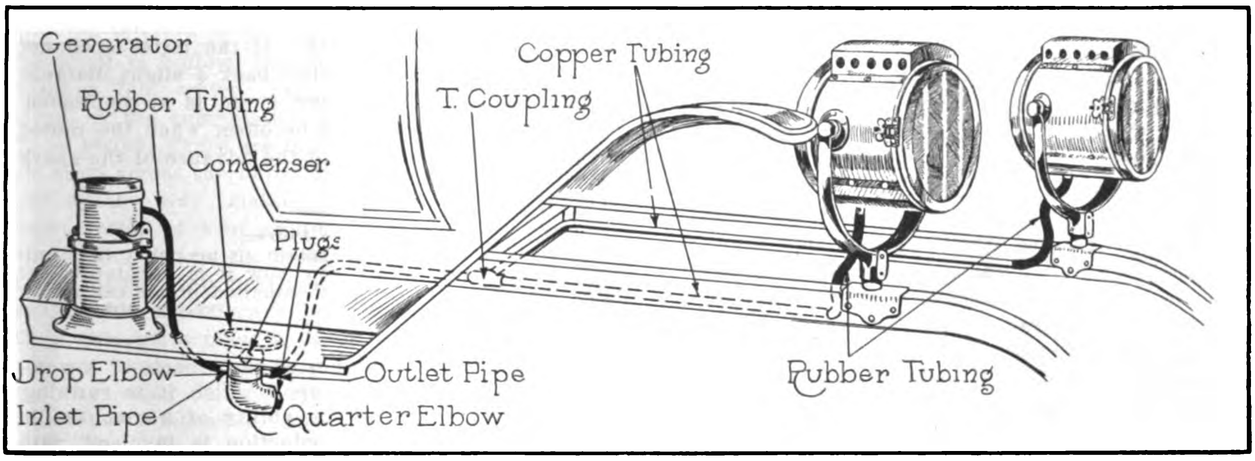


Fig. 3—Inexpensive Device for Catching Moisture in Piping of Acetylene Lighting System Utilizing a Generator.

The clutch leather should be left about .25 inch short and the two ends riveted to the cone first so that they butt against each other. The leather is then soaked with hot water and stretched onto the cone, in much the same manner as a pneumatic tire is fitted to a rim. As the leather dries it will shrink tightly into its place. It is then secured by copper rivets, care being taken to see that the heads are well below the surface of the leather. The cone is next mounted on a lathe and the material trued up. In fitting the leather it is best to mount it with the shiny side of the material next to the cone.

After the clutch has been replaced it should be soaked liberally in oil and during the first 50 or 100 miles be well lubricated. It is essential that the leather be kept soft and pliable as when it becomes hard it is apt to burn or char when slipping.

Vibrator Inoperative.

(77)—What is the cause of failure to start from the switch of a Bosch type of dash coil such as employed on the Marion car? I can start on the batteries by cranking, but when I push down the button on top of coil there is no buzz and the motor won't start. A set of batteries lasts but a short time. Was informed by a repairman that the coil was short circuited and was advised to ship it to the Bosch company for repairs. A READER.

Providence, R. I., May 11.

It is evident that a short circuit exists. The best plan would be to remove the coil, an operation accomplished by unscrewing the cap, which will permit the withdrawal of the coil proper, and send it to the maker. The Bosch Magneto Company maintains a service station at Boston near the Motor Mart. Perhaps it would be advisable to drive the car to Boston and have the ignition system inspected thoroughly.

Water in Acetylene Pipes.

(78)—Am driving a model T Ford and operate a good deal at night. The gas lamps give me considerable trouble, and although I blow out the pipes and clean the burners, they do not stay clear. Is there any way the trouble can be cured, or will a new generator be necessary? FORD.

Topeka, Kan., May 12.

To ascertain if the fault be that of the generator, examine the deposit in the bottom of the vessel and if it be dry it denotes that the device is operating properly. If the material be wet or soggy, and the lights continue to burn for some time after the generator is shut off, it shows that the latter is not working properly and that the water is not feeding as it should to the carbide.

In the case referred to the trouble is more apt to be due to the presence of moisture in the tubing because of condensation. This usually occurs in the first 12 inches or so after the gas leaves the generator and consequently the pipe and rubber connections should slope directly downward to the lowest point in the system and continue a foot or more in order to drain any possible moisture toward the generator instead of in the direction of the lamps.

At Fig. 3 is a sketch which illustrates a method of incorporating a water trap for retaining any moisture that may be present in the system. It is constructed easily and is inexpensive as the material required may be procured readily from almost any plumber.

It consists of a drop elbow with a male thread, quarter-elbow and two plugs. The drop member has a flat flange perforated for screws and is attached under the running board as shown in the drawing. The quarter-elbow is screwed to this and plugs utilized to close the openings. The former is tapped and threaded to take a connector and a .25-inch copper tubing to which is attached the pipes leading from the generator to the trap, and thence to the lamps. All moisture will collect in the trap and can be removed easily by unscrewing the lower plug. A petcock may be installed if desired, in place of the plug member. As the trap will hold considerable water, and will require emptying occasionally, the device will answer all purposes as well as being cheaper than ready made water traps. The method of installation is also suggested in the diagram.

Stress and Strain.

(79)—Am a reader of your magazine and notice the reference to torsional and tensional strains and stresses, and that a certain part is made to take care of these. Will you kindly explain what is meant by the terms?
INFORMATION.
Cisco, Tex., May 19.

There is some difference of opinion among writers as to the definition of these terms. An external force applied to a body, so as to pull it apart, is resisted by an internal force, or resistance, and the action of these forces causes a displacement of the molecules, or deformation. Some writers call this a stress, and the internal force a strain. Others hold a reverse opinion. Some authorities never use the word "strain" in their writings to avoid confusion.

Merriman states: "A stress is a force which acts in the interior of a body, and resists the external forces which tend to change its shape. A deformation is the amount of change of shape of a body caused by the stress. The word 'strain' is often used as synonymous with stress and sometimes it is also used to denote deformation."

Stresses are of different kinds such as tensile, compressive, transverse, torsional and shearing. A tensile stress or pull, is a force tending to elongate a piece. A compressive stress or push is a force tending to shorten it. A transverse stress tends to bend it. A torsional stress tends to twist it. A shearing stress tends to force one part of it to slide over the adjacent part. Tensile, compressive and shearing are called simple stresses. Transverse stress is compounded of tensile and compressive stresses, and torsional of tensile and shearing. To these five varieties might be added tearing stress, which is either tensile or shearing, but in which the resistance of different portions of the material are brought into play in detail, or one after the other, instead of simultaneously, as in the simple stresses.

Lengthening Valve Stems.

(80)—I read in a motor publication that valve stems which had become worn and were not adjustable could be lengthened by placing on an anvil and hammering. I understand the ends are hardened and if the temper is drawn for drawing won't the metal have to be rehardened?
L. E. MOWRY.
St. Albans, Vt., May 29.

The ends of the stems are hardened and if the temper be drawn will have to be retempered. In drawing a valve stem care should be exercised not to bend it and the drawing should be at a point above the cotter pin hole and not at that portion that enters into the tappet member. While the writer has lengthened these members requiring but a slight increase, it is advisable to have it done by a blacksmith or some one familiar with the work.

Phosphor Bronze.

(81)—What is the difference between phosphor bronze and any other bronze? INQUISITIVE.
Hannibal, Mo., May 18.

Bronze is an alloy of copper and tin with small proportions of other elements. In the year 1868, Montefiore & Kunzel of Liege, Belgium, found by adding small proportions of phosphorus or "phosphoret of tin or copper" to copper that the oxides of that metal, nearly always present as an impurity in more or less quantity, were deoxidized and the copper much improved in strength and ductility, the grain of the fracture became much finer, the color brighter, and a greater fluidity was attained. The different bronzes are produced by combining different alloys such as silicon, aluminum, etc.

Timing the Spark.

(82)—I have an 1908 Oldsmobile roadster with a storage battery, coil and timer for ignition. The motor will not throttle down and I have closed the carburetor throttle as much as possible but it does not improve it as I wish. I cannot advance the spark very far without the engine knocking. Sometimes with the spark advanced a trifle I get a kick from the starting handle when cranking slowly. What is the cause? L. L. M.
Deming, N. Mex., May 10.

The ignition timing is too early; that is, the spark takes place before the piston comes to the top of the compression stroke. This accounts for the motor racing. It is easily remedied. Loosen locking nut or binding screw of commutator or timer on shaft and move arm with roller contact block back; that is, in a reverse direction to that in which it rotates when the motor is running. Try about a .25 inch; relock nut and start motor. If the latter does not throttle enough, set the roller back a slight distance and repeat until the desired speed is accomplished. This lateness of spark will be offset when the motor is running by the amount of the advance of the spark lever.

Tractive Power.

(83)—Will you please explain to me what is meant by tractive power or traction, how it is calculated, and what the effect of the gear reduction of an engine is?
OTHIS WHEAT.
Boston, Mass., May 24.

Traction is the adhesion of the wheels of a vehicle to the road or track upon which it is running, while tractive power is the ability of a machine to propel itself. The gear reduction is involved with this, for given a certain power, the greater the gear reduction, the more the tractive effort will be, while with the small reduction little tractive power will be available.

It is for this reason that an automobile has more than one speed. High speed is only used for straightaway stretches, when the car is in motion and has good traction. Little power is then required to propel it, and a small gear reduction will be used resulting in high speeds. Where the conditions are not favorable to speed, as on rough roads, slight hills, etc., a slower speed is needed and more tractive effort is required to propel the car over the obstructions. In the ordinary machine, second gear would be used, this being more of a reduction than high, but less than the other speeds. With still worse grades or road surfaces, even a greater amount of tractive effort is necessary.

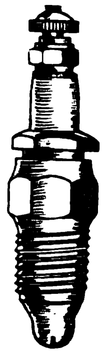
Useful Hints When Working Wood—When driving screws into wood with a screw driver, it is quite an advantage to use soap on the thread of the screw. Draw the screw across the bar of soap before inserting in the wood.

To whiten a surface for laying out work, mix whiting with gasoline to the consistency of paint, and cover the surface to be marked. The gasoline will soon evaporate, leaving a white surface on which lines can be easily scribed.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Vim Spark Plug, manufactured by the K-W Ignition Company of Cleveland, O., well known maker of ignition specialties, differs from the usual members in the manner in which it ignites the mixture in the chamber. The shell is hollow, providing a chamber into which the gas is forced by the compression stroke of the piston. There are four narrow slots across the bullet shaped nose of the plug, making for a concentration of heat around the firing point, and as the mixture is forced through this heat it ignites easily when the spark occurs. When this takes place a flame is shot out through the four slots into the vapor in the cylinder, facilitating combustion. Owing to the passage of the mixture the points are cleaned and it is said that sooting and fouling by oil is impossible. They are made with mica and porcelain cores in .5-inch pipe tap, metric or S. A. E. standard sizes.


Vim Spark Plug

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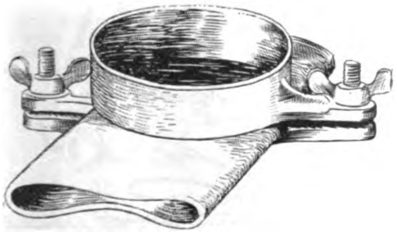
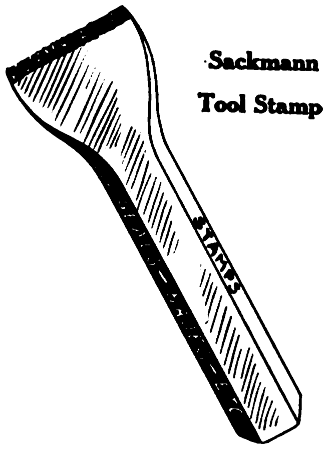
The Adamson Auto-Vulcanizer, made by the Adamson Manufacturing Company, East Palestine, O., is a portable repair kit weighing about three pounds with which it is claimed that a patch may be vulcanized perfectly in 15 minutes on the road or in the garage. The device is operated easily, the work consisting of clamping the tube with its repair gum in the holder and filling the latter with one ounce of gasoline. When the fuel is ignited the instrument automatically completes its work. The principle employed is that the temperature is governed automatically in relation to that of the gasoline during combustion. When the temperature of the fuel attains a certain degree, the volume of gas given off by it forces the zone of combustion above the heat conducting members. This allows the vulcanizer to cool slightly when the flame again lowers, and becomes effective. When the gasoline is first ignited the temperature of the device rises gradually to a certain vaporizing point of the fluid and remains constant. No cement or acid is utilized in the process. The kit comes complete and comprises the vulcanizer, gum, scissors, etc., is very compact and will appeal to motorists who undertake their own repairs as well as those who do considerable touring.


Adamson Vulcanizer



Sackmann Tool Stamp

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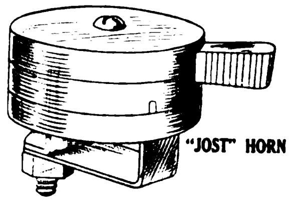
The Sackmann Tool Stamp is the product of the Sackmann Manufacturing Company, Akron, O., and is designed to mark tools with initials or letters, thus preventing mistakes as to ownership. Standard tools, like wrenches, pliers, etc., are hard to identify and are often borrowed and others returned by mistake. Numeral stamps are handy for marking the components when overhauling the power plant, thus facilitating the reassembly of the parts. The device is inexpensive and is made to order, although certain stock stamps are carried.

*

The Jost Horn Switch is manufactured by Frank Morse, Boston, Mass., maker of automobile and motor boat electrical appliances, and is designed for operation of any electric horn or signalling device requiring a switch. It is constructed neatly and well, being of hard rubber and occupies but little space. It is attached easily to the spoke of the steering wheel and may be operated by the thumb without relaxing the grip upon the steering member, a feature that will appeal to motorists. The lever is moved readily when an electrical connection is desired, and when released automatically cuts off the current. It is inexpensive and is accompanied by 10 feet of cord for attaching.


"JOST" HORN SWITCH

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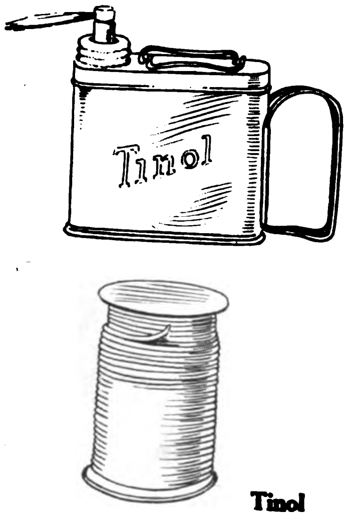
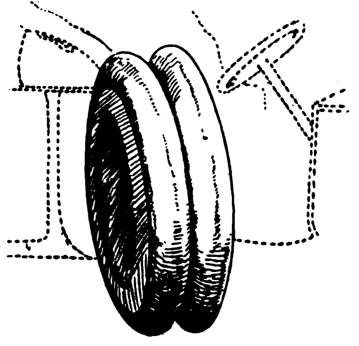
Tinol is a new soldering outfit produced by Hess & Son, Philadelphia, and consists of an alcohol torch, soldering copper, can of paste and a spool of solder wire. The latter is tubular and filled with a special Tinol flux and the entire outfit comes in a neat leather case. It is very compact and with it repairs may be made upon the road as it is claimed by the maker that no careful cleaning of the part is necessary, owing



Tinol

to the special flux employed. It is stated that electrical joints may be soldered by wrapping the part with a piece of waste wet with gasoline and burning off the fluid, after the damaged place has been coated with Tinol paste. The latter is also employed for mending piping leaks, and it is held that an amateur may repair leaky radiators successfully. The outfit is not expensive and should prove a valuable acquisition to the tool kit of the motor car as well as the private garage.


Amphi Tire Trunks

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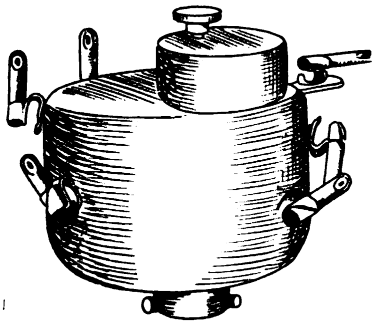
Amphi Tire Trunks, made by the Coward Auto Supply Company, Motor Mart, Boston, are adapted to take the place of a door, so that installing them at the side, on the running board, does not mean the obstruction of one of the doors as is usually the case. The trunks are supplied with a swivel mounting and can be fitted at either the side or the rear. They are water and dust proof, do not rattle, and are suitable for any kind of tire or demountable rim.

★

The Monitor Distributor is made by the Motor Specialties Company, Waltham, Mass., and is designed for use with a single unit coil, furnishing sparks to any number of cylinders. The distributor in combination with a six-volt battery, may be used instead of a high-tension magneto for ignition purposes at about one-tenth of the cost of installation. It is especially recommended for use on motors which run at high speeds. A feature of the construction is the shaft, which is of solid steel and runs through a very long phosphor steel bearing of perfect finish. This construction eliminates the fault of rocking or wabbling and secures a true and smooth running machine of long life. All the primary parts are at the top of the instrument where they are accessible by removing the cover. The contact is of a slightly wiping character, enough to keep the surfaces clean, and by means of a screw the duration of contact may be adjusted to suit the motor or coil. The body of the instrument is strong and impervious to water and oil.


Monitor Distributor

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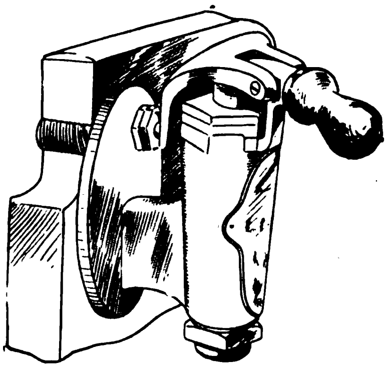
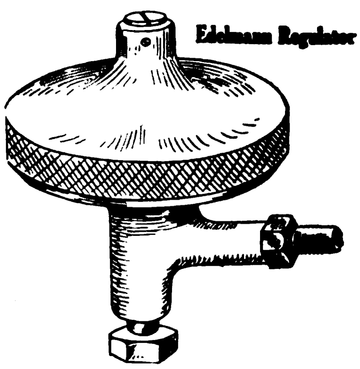
The Flash Auto-Lighter is a system for automatically lighting or extinguishing acetylene headlights from the driver's seat, made by the Motor Specialties Company, Motor Mart, Boston. It comprises three parts, the controller, which is illustrated, an induction coil, and a pair of special burners. The controller combines a gas valve and an electric switch, the two being operated by the one lever. It is so timed that sparks are produced at the burners before the opening of the gas valve. The turn of the lever starts the sparking at the burners and admits the gas to the piping. The coil is of the ordinary single unit type, of high grade, finished in mahogany and brass and thoroughly guaranteed. In order that the lighter may be entirely independent of the engine circuit, the coil is provided with four terminals for the primary and secondary wires. The burners are made to fit any standard lamp and are provided with sparking points rigidly clamped in position over the gas vents. The points will not interfere with the light given by the burners, and will not be jarred apart by the vibration of the car. The lamps are lighted instantaneously, by a single turn of the handle to the left, and may be extinguished as easily, by a turn of the handle to the right. The lighter enables the lamps to be controlled as easily as the motor, so that they may be extinguished when stopping or driving on city streets, with resulting economy. With the outfit are furnished gas pipes, union fittings, wires, terminals, etc.


Flash Auto-Lighter


Edelmann Regulator

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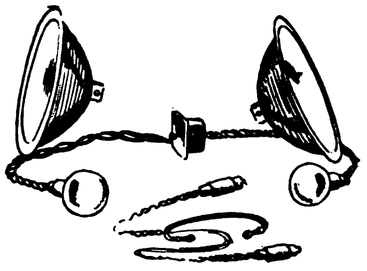
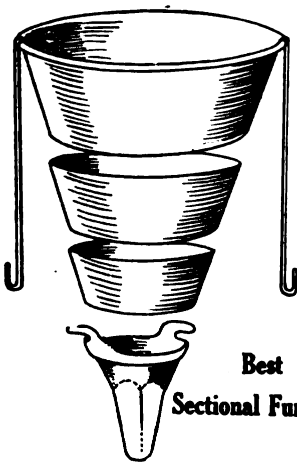
The Edelmann Regulator is manufactured by E. Edelmann & Co., Chicago, Ill., and is designed to be attached to pressure gas tanks, enabling the user to regulate the pressure of the gas delivered from the tank. It can be adjusted to deliver at pressures of from as low as two ounces, which is about the proper figure for supplying two .75-foot burners, to a pound or more, as desired. The regulator is made with a metal diaphragm which has long life. Adjustment is easily made by turning the screw in the cover.

★

The L. C. R. Lighting System is made by the L. C. R. Storage Battery Company, Dayton, O., and is designed especially for Ford cars. It consists of a set of parabolic reflectors to fit in the ordinary gas lamps, with wiring to connect the lamps with the magneto. The installation is an exceedingly simple one, not requiring an expert. It adds little to the weight of the car, as no storage battery is car-


L-C-R Lighting System

ried, current being taken from the magneto alone without danger of weakening the ignition, it is claimed. A switch installed on the dash or wherever convenient, controls the lamps. The reflectors are parabolic, silver plated, with a flange which will fit beneath the wire ring that holds the glass in the lamp, so that it is easy to install them. The globes are of Mazda make with Edi-Swan base. The outfit comes complete with all connections, terminals and wire, ready to be installed.


Best Sectional Funnel

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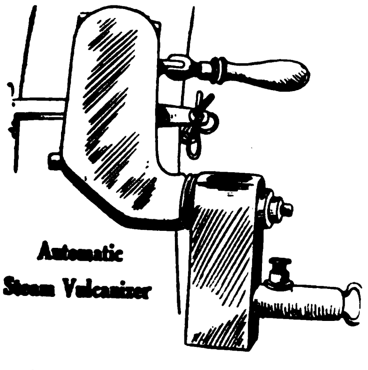
The Best Sectional Funnel is built upon the collapsible plan, being in four sections which when nested fit in a circular box 7.75 by 2.5 inches, enabling the funnel to be carried in the tool box without waste of space. It is made by R. L. Best, Bismarck, N. D., of 26 gauge steel, nickel plated, and is inexpensive. The two arms seen hanging from the rim of the funnel engage with hooks on the spout when the funnel is in use, making it rigid. The arms fold underneath when the sections are nested.

* * *

The Automatic Steam Vulcanizer is being placed on the market by the Simplicity Supply Company, Cleveland, O., and has been designed with the idea of producing an apparatus as nearly automatic as possible, requiring no attention in vulcanizing. The device has no gauge or thermometer. To use it is only necessary to light the lamp, no watching or other attention being required. It will do all kinds of work, either on the wheel or off, from vulcanizing cuts and tears in the casing to patches on tubes. The outfit is small and compact, taking up little room in the tool box. The cover of the box forms a vulcanizing board which may be clamped to the running board of a car, or wherever convenient.


Automatic Steam Vulcanizer

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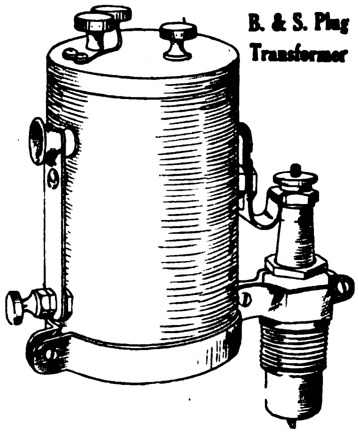
The B. & S. Plug Transformer is made by the Briggs & Stratton Company, Milwaukee, Wis., and is a complete vibrating spark coil mounted on the spark plug without any secondary wiring to leak. It fits any spark plug and gives a hot spark with low battery consumption. The cost of a switch and coil is saved and the device is said to give better results than a box coil, the vibrator being very rapid and causing a shower of hot sparks at the plug point. Installation is easy, there being only one primary wire necessary, thus preventing mistakes in wiring. The vibrator may be adjusted readily, and at the same time the whole instrument is water, heat and oil proof. It may be covered with a protection hood if desired. Four types are furnished, two for mounting on the plug as illustrated, and two for mounting on the cylinder where convenient. The latter require a short piece of secondary wire from the coil to the plug.


B. & S. Plug Transformer

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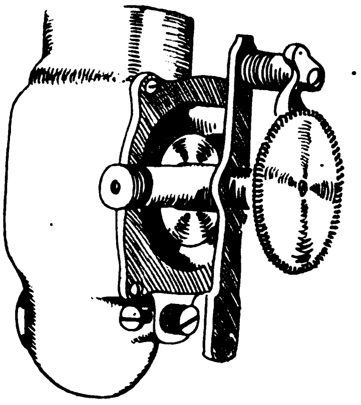
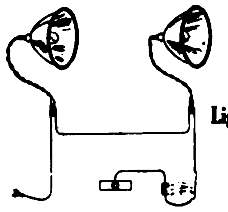
The Atkins Carburetor is made by the Atkins Manufacturing Company, Coldwater, Mich., and differs from other carburetors in that the float chamber may be located anywhere along the gasoline line as it does not stop the flow of fuel through the nozzle when the motor stops, but merely regulates the hydrostatic pressure on the nozzle. The float is thus not an integral part of the carburetor and is not shown in the illustration, which portrays only the carburetor proper, which may be placed in any position without affecting its operation. The instrument is very compact and is simple in action. The gasoline flows from the float chamber so placed as to furnish a gravity feed to the carburetor, and the throttle regulates this flow by increasing or diminishing the space around the nozzle. The throttle is connected to the lever seen between the toothed wheel and the body of the carburetor. Moving this lever moves the toothed wheel and the valve. The only adjustments are in the connection between the lever and the wheel, and the auxiliary air valve.

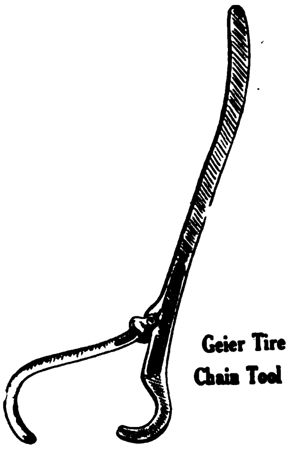

Atkins Carburetor

* * *

The H. & H. Lighting Outfit, made by the E. A. Hammer Company, Cleveland, O., has been specially designed for use with Ford cars, so that the owner of one of these machines can have electric headlights, at slight expense. Current is taken from the magneto, the wiring being from magneto to lamp and from lamp to ground, the two lamps being wired in series. The outfit consists of a pair of parabolic reflectors, two tungsten bulbs, switch and wires with terminals and clamps. The reflectors are of the parabolic type, projecting the maximum amount of light from the lamps, and the

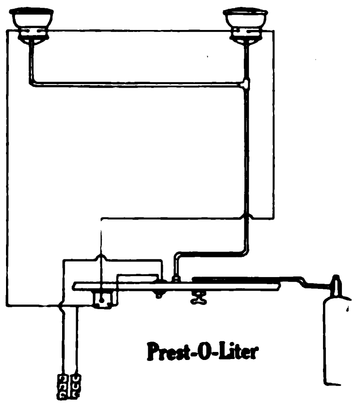

H. & H. Lighting Outfit

sliding socket enables the latter to be placed in the proper focus of the parabola. The bulbs are fitted with the Edi-Swan or bayonet lock base, which does not jar loose or break, preventing the lamp from becoming disconnected or injuring the reflector. The filament of the lamps is tungsten, tough enough to withstand the strain of automobile work and giving a brilliant light which will show the road ahead for 600 feet at 25 miles an hour.

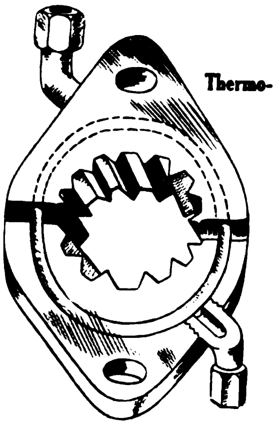

Geier Tire Chain Tool

The Geier Tire Chain Tool is sold by the Post & Lester Company, Hartford, Conn., and is used for tightening anti-skid chains. Those who have had trouble in applying these members on a wet day will appreciate this device, which makes it easy to bring together the ends of a chain for hooking. The tool is in two parts, both hooked to engage the tire chain. Depressing the handle brings the hooks on it and the movable arm together and in line, enabling the chain to be fastened.

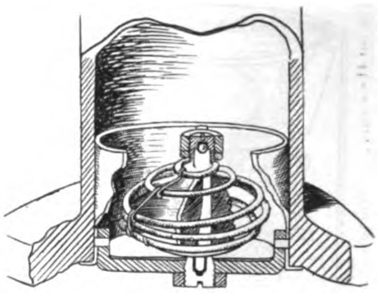
The Prest-O-Liter, made by the Prest-O-Lite Company, Indianapolis, Ind., makes possible the lighting, control and extinguishing of the acetylene running lights of an automobile from the driver's seat. It is made in three styles, for two headlights, two headlights and tail light and for two headlights, tail light and two side lights. The system consists of an automatic reduction valve attached to the gas tank, piping to the dash, controller valve for the dash, insulated burners with spark gap, spark coil and wiring. It is independent of ignition system, using separate battery and spark coil. The regulator valve, attached to the gas tank, keeps the pressure in the pipe line to the dash down to less than two ounces, so that there is no danger of an explosion as might be the case if the gas were under heavy pressure. To operate, it is only necessary to open the controller on the dash and push the button. This permits acetylene to reach the burners and produces a spark, igniting the gas. The handle of the controller is detachable, and the latter governs the gas so that any desired set of lamps may be lighted.


Prest-O-Liter

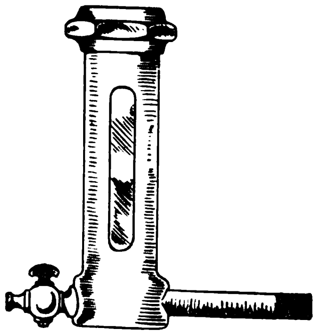
The Thermo-Gasket is a combined heating and mixing device made by F. W. Battershall & Co., Albany, N. Y. Less than .5 inch thick, it is designed to be bolted between the carburetor and the intake manifold of the motor, taking the place of a hot water jacket on the carburetor and of a mixer. The construction is easily seen in the illustration. Surrounding the opening through which the mixture passes is an annular passage through which flows a continual stream of hot gas, led from the exhaust manifold of the engine through copper tubing. By this means the device is heated and the carburetor and intake manifold as well, the mixture as a result being made homogeneous, with all particles of gasoline thoroughly vaporized by the heat. An additional feature of the device which assists in mixing is in the diagonal fins which not only radiate the heat into the mixture, but impart a whirling motion to it.


Thermo-Gasket

The Stanley Mixer is being placed upon the market by C. W. Jacob & Allison, New York City, and is a device to be located in the intake pipe above the carburetor. The construction is such that the incoming mixture rotates the coil and is itself set whirling, resulting in the gasoline and air being perfectly mixed before it enters the motor. All globules of gasoline are broken up and vaporized by passing through the mixer, resulting in increased power and fuel economy as well. The rotating member is made of stiff wire formed into a coil, within which is a pair of tilted propeller blades which whirl the device. The coil, or agitator as the maker calls it, is mounted on ball bearings and is very easily turned, offering little or no resistance to the passage of the gases.


Stanley Mixer

The H. & H. Oil Gauge has been designed specially for use on Ford cars by the E. A. Hammer Company, Cleveland, O. It is attached to the bottom of the crankcase, and shows the amount of oil therein at all times. No drilling of the case is necessary to install the gauge stem first being inserted in place of the petcock with which the case is provided, and the petcock being located in the gauge itself. The gauge has been improved over the previous model produced by the company in that means have been provided for draining without removing it. It is turned from a solid brass bar, making it very substantial.


H. & H. Oil Gauge

UP-TO-DATE Machine & Tool Equipment

CRITCHLEY EXPANDING REAMER.

Reamers are exceedingly useful tools in the repair shop as they are used frequently to enlarge holes to size. A complete equipment of these members in order to take care of different work means a large investment. The Critchley patent expanding reamer, manufactured and marketed by Chadwick & Trefethen, Portsmouth, N. H., is designed to do the work of several instruments, inasmuch as the cutters are adjustable, permitting the reaming of odd sized holes, a feature which will be appreciated by the average workman.

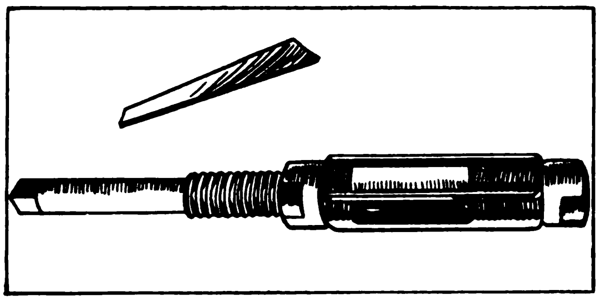


Fig. 1—Critchley Expanding Reamer Fitted with Adjustable Cutter Blades, Permitting Reaming of Odd Sized Holes.

The device is shown at Fig. 1 and it will be noted that a screw thread is cut on the body of the tool on either side of a space. The latter is left uncut to insure stability. Five grooves or slots are made on the shank to take the cutters which are beveled at each end and held securely by nuts. When in normal position a certain standard size is obtained. An enlargement is secured by loosening the retaining nuts and moving the cutters in the grooves, increasing the diameter of the cut.

Very fine measurements may be secured easily. The graduations vary by sixteenths, beginning at .46875 inch diameter, although in larger size the reamers vary from .125 to .25 inch. The reamers are not expensive and extra cutters may be secured for a small sum. The device is constructed from a high grade material and all parts are strictly interchangeable.

PORTABLE ELECTRIC GRINDER.

Grinding machines are important factors in the equipment of the machine shop, and not only are they economical in the manufacture of machinery and tools, but they produce the same degree of accuracy and excellence when used either on hardened or soft work. While there are many forms of grinders, those of the portable type and designed for attachment to the lathe, shaper or miller are very efficient.

The design depicted at Fig 2 is the product of the Hamilton-Beach Manufacturing Company, Racine, Wis. It is an exceedingly handy tool for grinding dies, reamers, cutters, etc., and operates equally well on external or internal work. It is claimed by the maker that a .25-inch hole four inches deep may be ground easily and accurately as the device is sturdily constructed and free from vibration. Any kind of wheel may be utilized and felt or oil stones may be employed when a very fine finish is desired.

The grinder is operated by electricity and a direct or alternating current may be employed. The motor is 1-12 horsepower and drives the grinding wheel at 10,000 revolutions a minute. It is air-cooled and proof against heating from overload. The device is very light, weighing as it does, five pounds. The outer casings are constructed of aluminum, highly polished and the dust proof bearings are made of a high speed nickel babbitt. The armature is ground on centres to a mirror finish, assuring extreme accuracy. Adjustable end thrust and main bearings take up all possible wear.

The grinder comes complete with 10 feet of special cord and attachment plug permitting connection to any electric light socket. It is stated by the maker that it may be operated economically, consuming but little current and that hardened tools may be ground accurately. Cutters may be ground without removing them from the milling machine.

SACHS MAGNALAMP.

One of the difficulties experienced by machinists is arranging the lighting equipment so that the work is properly illuminated. Before the electric lamp came into general use gas was utilized, and by means of pivotal joints the flame was brought into the desired position, an operation requiring considerable time.

Even with the ordinary electric lamp there is trouble in locating it so that good results will be obtained. Tie cords, hinged brackets, pedestals, rods, etc., are employed but these have the disadvantage of requiring time for adjustment. A device which eliminates all these troubles, as well as meets with the demand for a light just where and when needed, is the Sachs Magnalamp, which was recently brought

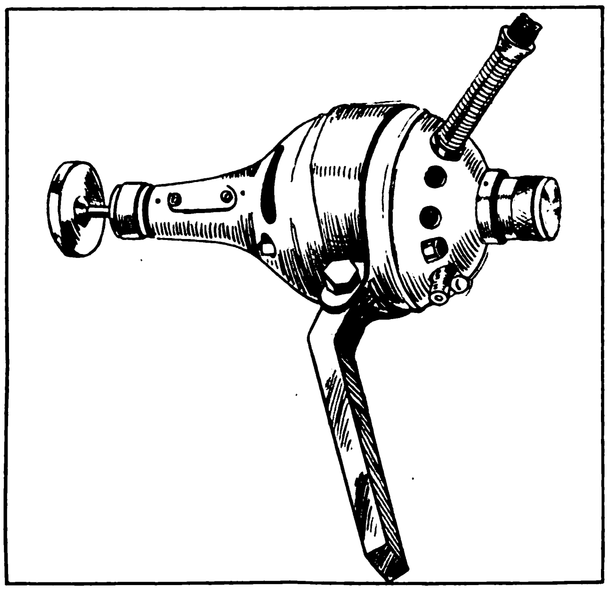


Fig. 2—Hamilton-Beach Portable Electric Grinder, Adaptable to Internal and External Work.

out by the Sachs Laboratories, Inc., Hartford, Conn.,

It is a portable device and similar to the ordinary electric lamp with the exception that it is equipped with a magnetic extension as will be noted by reference to Fig. 3. This projection carries a highly efficient electro-magnet which is combined with the lamp and connection socket, and a switch in a cylindrical structure. It is very compact, being three inches high and 2.5 in diameter. The bulb is protected by an electrically welded guard. The lamp extends either longitudinally from the top end of the cylinder or radially from the side, and its position may be changed easily and quickly. A connecting plug attached to a flexible cable, may be fitted in either receptacle of the device, and the other end of the cord carries a socket member for attachment to the usual lighting circuit.

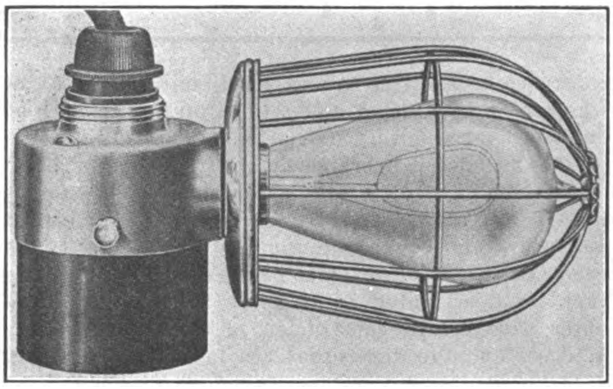


Fig. 3—Magnalamp, an Electrical Device Self-Adhering to Metal by Means of Self-Contained Magnet Operated by Push Button.

A main switch is provided, this being only operative when the magnet device is not in use. It is operated by turning a knurled disc forming the central pole piece of the magnet, completely closing or opening the circuit with each snap. Pressing a push button on the side of the cylinder releases the grip of the magnet so that the lamp may be placed, removed or changed instantly. Releasing the button brings the magnet into service again. After the light has been turned on by the switch the current will continue to flow irrespective of the manipulation of the magnet.

The device will adhere to iron or steel surfaces, smooth, rough or uneven, painted or unpainted, and its grip is unaffected by heat, cold or vibration. One of the many uses to which it may be put is depicted at Fig. 4, which shows it attached to a piece of machinery in operation.

The Magnalamp requires a direct current and is furnished in two standard voltages, 110 and 220 for use with 16 candlepower carbon filament lamps. If utilized with lamps of less candlepower the magnetic grip is said to be less, due to the small amount of current, as the 110-volt member requires about .5 ampere and the 220 about .25 ampere.

Magnalamps are made for service with higher candlepower and for use on other voltages than those designated. In addition to being of service when operating the lathe, drill press, miller, etc., the Magnalamp will prove of value when working on the motor car as it may be attached readily to any metal part of the chassis, facilitating the work. It is not expensive and for a small sum may be augmented by a counter balance device which permits the use of the lamp either with or without the magnetic member.

THE UNIVERSAL AUTO-TURNTABLE.

Numerous stables and other buildings are converted into garages and the original design is such that they do not lend themselves readily to the storage of automobiles without the operator of the car exerting considerable skill in backing the machine into its position. This is especially true of long, narrow buildings. To overcome these difficulties a turntable is fitted and the majority of up-to-date concerns are equipped with one or more of these devices.

Accompanying illustration, Fig. 5, presents the product of the Canton Foundry & Machine Company, Canton, O., maker of cranes, jacks, etc. A feature of the Universal turntable is that it may be installed easily, requiring as it does, but a depth of 12 inches, this arrangement permitting of utilization on upper floors as well as the ground. The device is ball bearing, seven balls operating in a patented grooved, serpentine track. These balls are spaced properly and sustain the weight, and as each member is crowded over the summit another follows into its place. All balls not on a summit revolve in lubricating oil with grooves fully protected from dirt.

The superstructure is of structural steel, built in truss form, top plates are braced, and the entire construction makes for great strength and durability. The table proper has a checkered iron centre, with steel plates extending to its periphery, and these members are sloped slightly to provide for drainage. They are also reinforced by angle irons at proper intervals, these being riveted crosswise underneath and supported on structural trusses. The only foundation required is circular concrete, perfectly level, and slightly larger than the table. The former is grooved to provide drainage to the sewer.

The Universal table is furnished complete with angle iron foundation supporting band firmly bolted to outer rim and the former is fitted with bolts for imbedding into the concrete floor thus holding the band in place. The tables which are operated easily by one person, are made in four sizes, 108, 132, 144 and 156-inch wheelbase with table diameter of 12, 14, 15 and 16 feet, respectively. Each has a supporting capacity of 8000 pounds. A feature of the device is that it cannot tilt as the slightest depression throws castor wheels on the outer rim to the rim track.

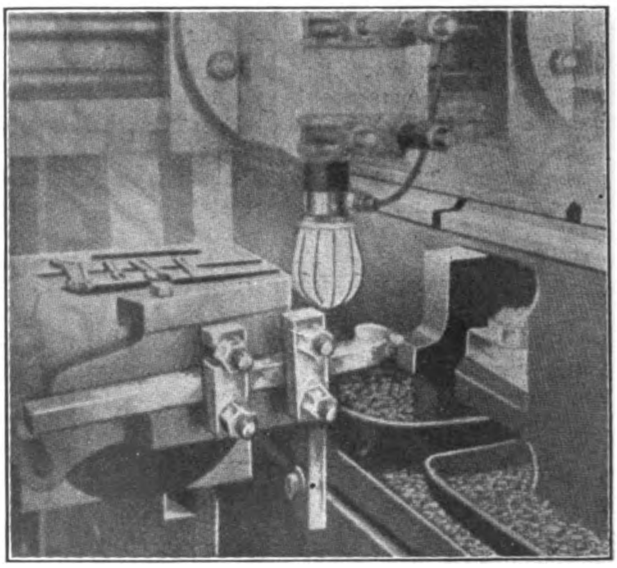


Fig. 4—Showing the Magnalamp Attached to Operating Machinery.

NEW VICTOR AIR COMPRESSOR.

The up-to-date garage no longer relies upon the hand pump, but is equipped with a compressed air system, an arrangement permitting of the storage of air for the inflation of tires, and cleaning the upholstery of the motor car, as well as the chassis. The Victor Electric Company, Chicago, has brought out a new compressor which is designed to be belt driven from a line shaft.

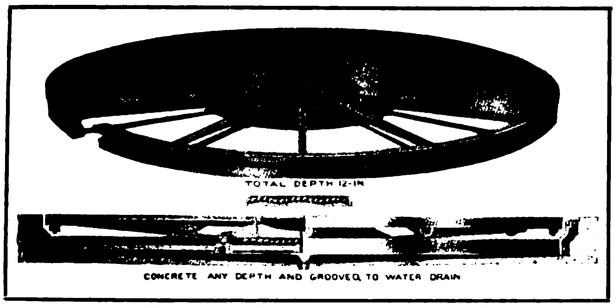


Fig. 5—Universal Auto-Turntable of 8000 Pounds Capacity, Which Operates on Ball Bearings and Requires but a Depth of 12 Inches.

It is a double-cylinder unit, having a 2.5-inch bore and two-inch stroke. The pistons are fitted carefully and means have been provided for keeping these well lubricated. The valves are especially designed and are constructed to withstand the great strain to which they are subjected in operating at high speeds.

The compressor, which is shown at Fig. 6, can be operated safely up to 360 revolutions a minute at which rate it gives a capacity of four cubic feet or 30 gallons of free air a minute. A pressure of 125 pounds may be maintained easily and a higher ratio if desired. The pulley is located between the cylinders and it is claimed that the device operates with the least possible noise, that all parts are interchangeable, and that it is economical in operation.

REMOVING STUBBORN NUT.

While a stubborn stud or sheared bolt is difficult to remove, one can usually unscrew a nut without much trouble, even if it has become more or less rusted in place. A good method to take off a nut that seems to resist being parted from its stud or bolt more than usual is to heat an open spanner that fits the nut and let it rest against the nut for a few minutes. The heat will expand the nut without producing corresponding expansion of the bolt and it may be unscrewed easily. The spanner or end wrench may be heated in a blow lamp flame, and while this kink is very old it is not generally known. One should not heat a hardened wrench or an adjustable member as it may be rendered unfit for use. The blow lamp flame should not be applied to the nut direct because the bolt will be heated and will expand as well as the nut. Kerosene may be poured around the threads with good results, especially if the nut has rusted in place. Several alternate heatings and applications of oil may be needed before the nut is loosened, and if it still resists, a light tapping with a hammer on all the facets while it is hot may assist in having it become looser on the threads.

MACHINING WORK SQUARE IN LATHE.

It is considered a difficult task by some to machine a piece square in a lathe without a special attachment. But it can be done as follows, when there is no other machine at hand: Clamp a toolmaker's vise to the face plate and place the piece to be machined in it with enough projection to permit of facing off one side. Then place the finished side toward the fixed jaw and machine the next face, and so on until the desired work is done. If care be taken in clamping, the job may be done to a surprising degree of accuracy and in a short time.

BEARING SCRAPER.

Motorists who attend to their own repairing, including the overhauling of the power plant, may have occasion to scrape in a bearing which operation will be facilitated by the use of the proper tool. Although not expensive some prefer to make an instrument. This may be accomplished by taking a fairly good sized three-cornered file and grinding off the burr on an emery wheel. This may be done at some shop equipped for this work. When fitted to a wooden handle, the tool will form a valuable addition to the garage equipment.

NEED OF ACID BRASS SOLUTION.

One of the difficulties to be met with in the art of electroplating is one brought about by the automobile industry; viz., the need of a heavy deposit of brass. The present process is by immersion in a solution of cyanide of copper, but the resultant deposit is not only slow in forming but unsatisfactory because of what is technically known as "spotting"—a discoloration in spots which appears on the work after it has been polished and lacquered. Cast metal seems to give the most trouble. This defect is considered as being caused through the absorption of the acids or alkaline solutions by the pores of the metal, or small blow holes which are only partially covered by the deposit, leaving minute openings through which the solution oozes out.

Several remedies have been suggested and tried, such as boiling the parts out in some neutralizing chemical solution or heating in a drying oven for several days, but a remedy completely satisfactory still remains to be found. It would be a great advance if an acid brass solution could be discovered. There is one for copper and another for zinc, but none for brass.

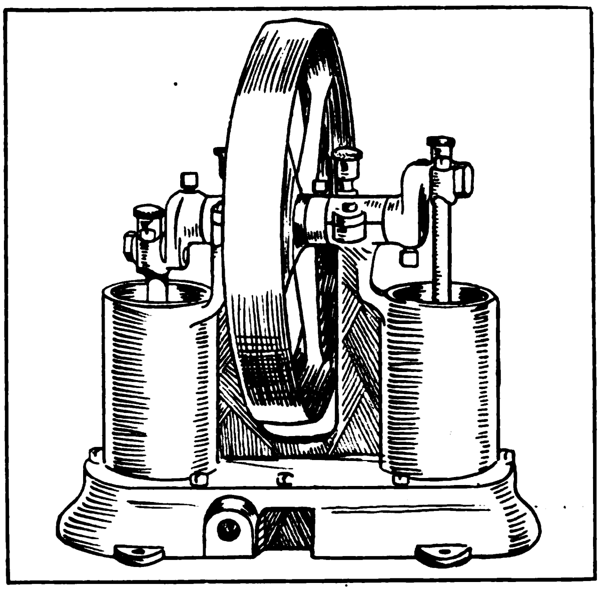


Fig. 6—New Double-Cylinder Compressor Brought Out by the Victor Electric Company.

INDUSTRY IN INDIANA.

The report of E. Dana Durand, director of the 13th census, concerning the manufactures for the State of Indiana, sets forth the following with respect to automobiles, including bodies and parts:

"This industry, for which but one establishment was reported in 1899, had increased in 1904 to 11 establishments, with products valued at $1,639,000. In 1909 there were 67 establishments, the value of whose products amounted to $23,764,000, or more than 14 times that reported in 1904. The manufacture of automobile bodies and parts has become so interwoven with other industries that it is not possible to state how fully the statistics show the magnitude of the industry. A number of the foundries and machine shops, and establishments engaged in the manufacture of electrical apparatus and supplies incidentally manufacture automobile accessories and parts, while a number of the establishments in Indiana classified under the heading, 'Rubber goods, not elsewhere specified,' manufacture automobile tires."

The increase in number of cars produced during the five-year period between 1904 and 1909, insofar as the report can be made without disclosing individual operations, is best set forth in the following table:

Pleasure Cars—	1904		1909	
	No.	Value	No.	Value
Buggies	..	......	1,639	$652,956
Gasoline	..	......	1,576	......
Electric	..	......	63	......
Runabouts	578	$620,334	8,139	5,055,208
Gasoline	208	298,850	8,100	......
Electric	370	321,484	39	......
Touring	424	787,969	6,838	10,710,289
Gasoline	387	735,669	6,838	......
Electric	*37	52,300	....	......
Enclosed	..	......	439	772,401
Gasoline	..	......	100	......
Electric	..	......	339	......
All others	..	......	32	147,232
Gasoline	..	......	30	......
Electric	..	......	2	......
Totals	1002	$1,408,303	17,087	$17,224,231
Gasoline	595	1,034,519	16,644	16,553,237
Electric	407	373,784	443	670,994

Commercial Cars—	1904		1909	
	No.	Value	No.	Value
Delivery wagons	18	$20,160	107	$157,358
Gasoline	..	......	31	......
Electric	18	20,160	76	......
Trucks	..	......	59	223,347
Gasoline	..	......	32	......
Electric	..	......	27	......
Totals	18	$20,160	166	$380,705
Gasoline	..	......	63	......
Electric	18	20,160	103	......
Grand totals	1020	$1,428,463	17,353	$17,604,936
Gasoline	595	1,034,519	16,707	16,734,648
Electric	425	393,944	546	870,288

*Includes one steam touring car.

The growth of the industry is set forth in another manner in the following:

State of Indiana.

	1904	1909
Number of establishments	11	67
Persons engaged	921	7753
Proprietors	6	36
Salaried employees	99	920
Wage earners	816	6797
Primary horsepower	760	5813
Capital invested	$1,194,000	$16,722,000
Salaries paid	80,000	870,000
Wages paid	496,000	4,131,000
Cost of materials	824,000	14,995,000
Value of products	1,639,000	23,764,000
Value added by manufacture	815,000	8,769,000

City of Indianapolis.

	1904	1909
Number of establishments	4	17
Persons engaged	509	2782
Proprietors	...	9
Salaried employees	62	379
Wage earners	447	2394
Primary horsepower	...	2296
Capital invested	$810,000	$5,066,000
Salaries paid	56,000	329,000
Wages paid	278,000	1,466,000
Cost of materials	554,000	5,994,000
Value of products	798,000	8,840,000
Value added by manufacture	244,000	2,846,000

NEW CARBURETOR COMPANY.

The New-Miller Manufacturing Company has been organized in Indianapolis for the production of the Miller carburetor, which first made its appearance in Los Angeles some few years ago. Although no attempt was made to exploit the device through the country until during the Madison Square Garden show in January, 1911, it has been impossible for the Miller Carburetor Company, which originally undertook its manufacture, to take care of the demand. The new concern has acquired a substantial factory in Indianapolis and its executive offices are located in the Murphy building in that city.

The Indianapolis plant will have a capacity of over 70,000 carburetors a year. The officers of the company are: President, F. C. Fairbanks; vice president, A. W. Nash; secretary, K. K. Parrot. L. H. Colvin, formerly sales manager of the Warner Manufacturing Company, Toledo, O., will act as general manager of the organization.

It is claimed that the Miller carburetor is a distinct departure. It is operated mechanically, the opening of the throttle introducing exactly the proper proportions of gas and air into the cylinder, and it is held that when it once has been set will supply this mixture at all speeds. The control is so constructed as to be attached either to the dash or the steering post, and by it the driver is enabled to regulate the flow from the seat, making it unnecessary to raise the hood and adjust the vaporizer for different grades of gasoline or because of climatic conditions.

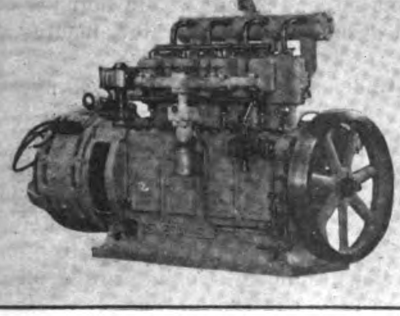
DIESEL ENGINE COMING.

Dr. Rudolph Diesel of Germany, inventor of the famous Diesel engine, is at present in this country for the purpose of interesting American automobile makers in the utilization of his motor. He declares that within a year it will be adopted as the propulsive agent for motor trucks, and that it is only a question of time before it will be employed in pleasure cars as well. The Bureau of Commerce and Labor in Washington learns that at least one American manufacturer is considering the subject seriously, and while this concern is not engaged directly in the production of vehicles, it is possible that it contemplates future possibilities.

As is more or less well known the Diesel engine was originally produced in 1897. It is built in both two and four-cycle types, and will burn any hydrocarbon from the very heaviest of crude oils to the lighter distillates. It is even claimed that animal and vegetable oils may be utilized for fuel, excellent results having been obtained with both castor and palm oils.

Dr. Diesel delivered an address concerning his motor before the American Society of Mechanical Engineers in New York, recently, this lecture being under the auspices of the gas power section.

Gasoline—Electric Sets



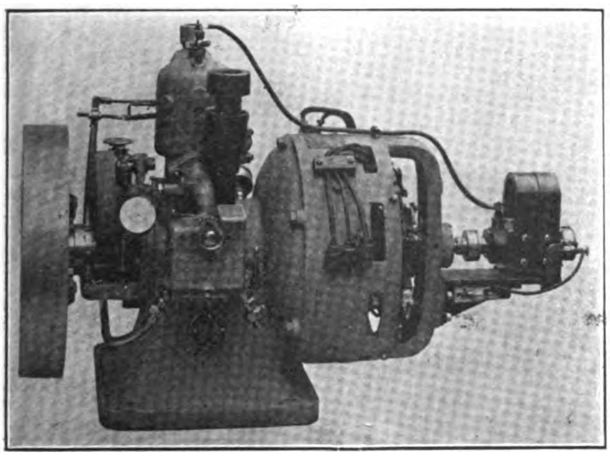
Generating Current for the Garage & Repair Shop.

ALTHOUGH the development of the internal combustion motor may be attributed, to a certain extent, to the automobile, its industrial value was early made manifest, and today it is utilized wherever a small power plant is required. It has replaced older forms of energy, such as some types of water wheels, wind mills, etc., and even in some instances, steam. Its convenience is an established and accepted fact, as the gasoline engine may be operated as little or as much as desired, needing no other attention than fuel and lubricant. Its economic value lies in that by simply throwing a switch and turning a lever, power is developed instantly, and when not in operation no expense is involved.

Power Equipment Important.

Throughout the country the mechanically propelled vehicle is supplanting the horse drawn, both for pleasure and commercial purposes, and the rapidly increasing number of these in service affords opportunity for the establishment of garages and repair shops for their care and maintenance. Where these are located outside the zones of the central service station, the question of power is an important factor, inasmuch as it is essential that the equipment be complete to comply with the peculiar requirements of the business. In order to meet competition the garage and repair shop must include those facilities which make for reliable and prompt service, and it is reasonable to presume that the country resident will insist upon the same attention as may be obtained in the city.

Energy for operating the lathe, drilling and milling machine, compressor, water pump, etc., can be supplied by the gasoline engine, but the repair industry necessitates more or less night work. This brings up the question of proper lighting facilities. Unlike some trades, the mechanical features of the automobile require an efficient portable light. The kerosene or acetylene lamp is not suitable owing to the danger of even a small amount of gasoline being ignited by the naked flames, creating considerable damage if not total destruction of the property.



Depicting One Kilowatt Gasoline-Electric Generating Set Which Develops a Direct Current at a Steady Voltage.

Advantages of Electricity.

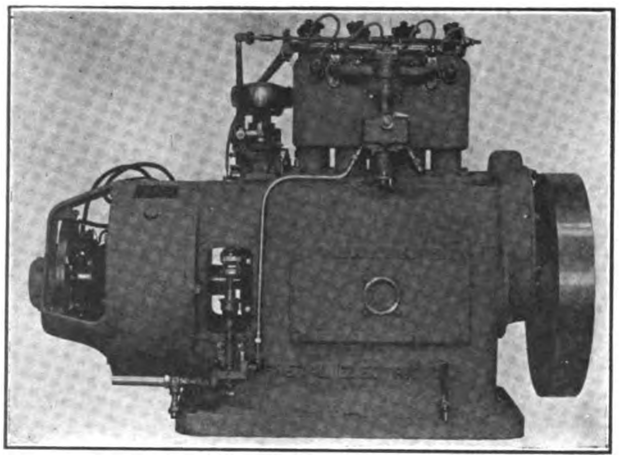
The advantages of electricity in the garage are legion. Not only is an excellent and safe light obtained but the current may be utilized for numerous purposes. It may be employed to operate a portable drill, polishing machine, air compressor, machinery, etc., and in addition the commodity has another important value in that a desirable trade may be built up in the charging of electric vehicles and storage batteries. Ignition batteries are generally employed with the motor car and the garage which is compelled to send its customer's batteries to the city for recharging receives but little recompense thereby, to say nothing of the delays and danger of injury during the transportation of the current containers.

It is only natural to presume that the garage situated beyond the zone of the central station would attract a desirable clientele if equipped with adequate facilities for the charging of electric vehicles, as it is obvious, for instance, that many summer residents would utilize electric carriages were means obtainable for charging.

The early attempts to couple the gasoline motor to the generator were not satisfactory, owing to the special conditions demanded of the unit. An efficient gasoline-electric set requires a direct or shaft drive with speed sufficiently high and with impulses frequent enough to produce the even turning movement absolutely essential to steady voltage. The motor also should be so governed as to insure the maintenance of uniform speed on both fixed and varying loads. Other necessary features are: Economical fuel consumption; high electrical efficiencies at the rated capacity of the set, with a minimum of decrease in efficiency and increase in fuel a kilowatt at slightly underloads, and ability of the unit to carry an overload without undue overheating of the generator.

Application of Service.

The United States government was one of the first to demand a unit to meet the above requirements and to conform to these as well as the demand for a lighting equipment for an installation beyond the zone of the central station, the General Electric Company, Schenectady, N. Y., began experimentations, which resulted in the manufacture of the gasoline motor driven electric generating sets illustrated herein. These are designed for the specific purpose of supplying the



Three Kilowatt Generator Is Operated by a Four-Cylinder, Four-Cycle Motor and Furnishes 2400 Candle-power.

best quality of service where electricity is not otherwise available.

These units may be employed to supply current for charging electric vehicles, and ignition or lighting batteries; to operate the machine equipment of the garage, and to light it as well. They are constructed in four sizes, ranging from one to 25 kilowatts and with the exception of the smallest the gasoline motors are of the four-cylinder, four-cycle, water-cooled type. The one kilowatt set has a single-cylinder, two-cycle engine, with three-inch bore and stroke.

The operation of these outfits is exceedingly simple. To start the set the ignition current is switched on and the engine cranked. Mounted upon an extension of the engine shaft is the armature of the generator, and as it begins to revolve between the poles of powerful magnets, the cutting of the invisible lines of magnetic force between these poles by the copper conductors of the armature produces an electric current by a process called induction. This is collected from the commutator by means of brushes and is transferred over the wire circuit, where it is always ready to be utilized for light, heat or power, or it may be stored in a battery.

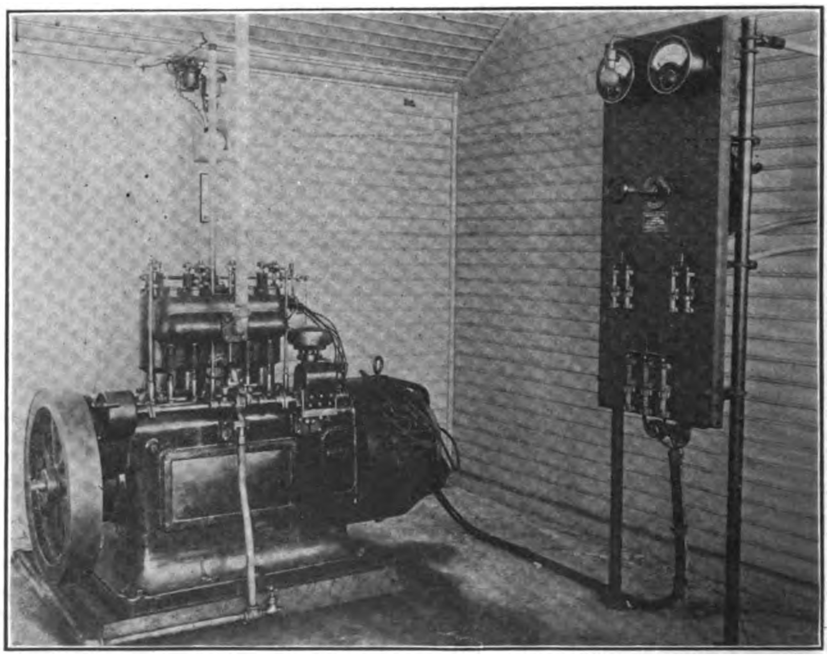
As these small power plants are installed beyond the limits of the central station and expert attendance, it is important that the materials be of the very best quality, and the design, simple. The motors built by the General Electric Company are accurate in design and standardization, being constructed in accordance with the best engineering judgment and highest mechanical skill at the service of this company. Years of experience in producing gasoline motors and generators for railroad service on rural lines and for government service, are reflected in the result, and absolute reliability and simplicity are features emphasized.

The lighting engine must operate evenly and smoothly at all loads, for any variation of speed, however slight, will be noted immediately by a flickering of the lights. Variations of speed not easily noted on a speed indicator will appear prominently upon the lamps. To insure steady and even operation the sets are provided with a centrifugal governor, located in the flywheel, this being so constructed that it is very sensitive and capable of responding instantly to changes in loads. It limits the variation in the speed of the motor from no load to full within four per cent. which, with the design of the generator, insures constant voltage.

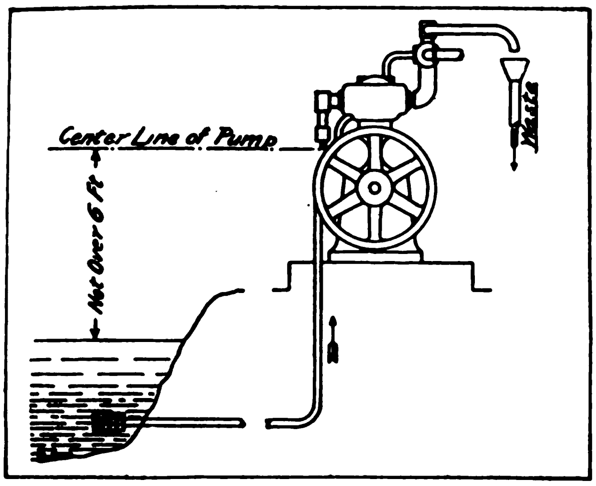
The four-cylinder motors of the three, five and 10 kilowatt sets are cast en bloc, that of the larger size having cylinders cast singly. The bore and stroke dimensions are 2.5 by five, three by six, five by six and 7.25 by 7.5, respectively, and the speed revolutions a minute are 800, 750, 600 and 560. The cylinders are of a special high grade, close grained, gray iron, carefully machined and ground to size, as are the pistons. The engine base is a substantial one-piece casting, suitably designed for the requirements of the various sizes, and liberal inspection plates permit of easy access to all working parts. The crankshaft is a high grade, specially treated steel forging, accurately ground to size and is supported in two, three or five babbitt bearings according to size of the motor. The camshaft is also of high grade material and the cams are drop forged and pinned. All connecting rods are dropped forged and fitted with removable babbitt filled bearings. All exhaust valves are located on the side, but the position of the intake members is varied, the three and five kilowatt sets being fitted with valves in the head while the larger motors are of the T head type.

Components of Motor.

The carburetor is of the General Electric constant level type to which the fuel is delivered by a pump integral with the engine. The motors are not restricted to the use of gasoline, however, as kerosene, natural or illuminating gas may be utilized, by the substitution of a mixing valve. The 25, 10 and five kilowatt sizes are provided with a General Electric low-tension magneto and induction coil while the three kilowatt is equipped with a high-tension magneto. The intermediate sizes are started directly on the magneto, although batteries may be employed if desired. Forced feed lubrication is employed on the 10 and 25 kilowatt sets, with splash on the smaller sizes, an



Showing Installation of Generating Set in Private Garage, Including Switchboard and Automatic Clock Cut-Out.



Installation of Cooling System Where Water Is Taken from a Lake or Pond.

exception being noted with the one kilowatt, which being of the two-cycle type, is lubricated by mixing the oil with the fuel.

The single-cylinder motor is a two-cycle, three-port type with throttle valve located in the transfer port between the crankcase and cylinder. The same high grade material and workmanship are incorporated in the design and the set has all of the efficient qualities of the larger units. The sets require but little floor space and the generator is mounted directly upon the engine shaft and enclosed in a compact frame.

Cooling Methods Outlined.

All motors are water-cooled and the method of supplying the fluid to the jackets varies according to the location of the unit and available supply of water. The one kilowatt engine is fitted with the thermo-syphon system, utilizing a cooling tank having a capacity of about .80 gallons. Where the amount of water available is limited, the fluid may be cooled by a motor driven blower set forcing air through a gilled tube radiator. This is the standard equipment furnished for the United States army.

Where a constant supply of cold water is to be had the amount essential to cool the motor properly is about seven gallons a minute, when operating the larger set under full load and proportionately less for the smaller outfits. Where the motor is not more than six feet above the level of the water, as in the case of a pond, lake, creek or ocean, the fluid may be lifted directly by the gear pump on the engine and discharged from the jackets into a waste pipe as outlined in an accompanying illustration.

Where the height is greater than six feet, an auxiliary motor driven pump may be utilized, or a submerged coil of pipe, the top of which is connected to the discharge pipe on the engine utilized. The lower end of the coil leads to a small expansion tank on a level with the motor, or a trifle above. Another pipe from this container is connected to the gear pump. In this method the height of the engine above the water does not affect the operation of the pump, as it is practically a closed and balanced circulating system. The method of cooling is regulated according to local conditions and the company points out that these cannot be complied with until known.

Construction of Generator.

The generator utilized in connection with the motors is a General Electric multi-polar continuous or direct current machine designed especially to meet the requirements of the set. The field winding is compound and compensates for the drop in engine speed between no load and full, thereby maintaining a constant voltage through the entire load range of the set.

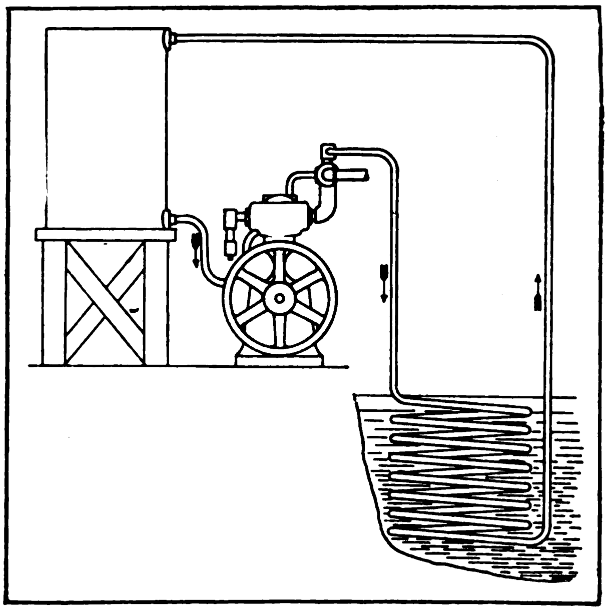
The armature of the generator is direct connected to the crankshaft of the gasoline engine and is supported in a ball bearing at the "outboard" end. Continuous current generators of all standard voltages can be furnished and alternating current members for special voltages are made upon special order. The 125-volt direct current generator, however, is considered standard equipment.

Lamp Loads.

The one kilowatt set is capable of supplying a total of 800 candlepower in General Electric Mazda lamps or 40 20 candlepower Mazda lights. The three, five, 10 and 25 kilowatt sizes furnish 2400, 4000, 8000 and 20,000 candlepower, respectively. The Mazda lamps supply approximately three times as much light as the carbon members with the same amount of current, and are important factors in the system, inasmuch as they reduce the power required to one-third.

A large number of these gasoline-electric generating sets have been installed by the company in private garages attached to country estates as well as at the sea shore and in the mountains where current cannot be secured from a central service station. In these days of refinement the city business man is loth to be deprived of the comforts of the city while sojourning at his summer residence and with a generating set the annoying inconveniences, such as poorly lighted houses, inadequate water supply, etc., are eliminated.

Electric motors operated from the generating sets can be utilized to drive domestic and farm appliances contributing to the comfort of the residents. By including a pump in the water circuit a plentiful supply of fluid may be pumped to the storage tank and the level of the latter may be maintained automatically. Motors may also be employed to operate vacuum cleaners, as well as laundry machinery. These sets are capable of supplying adequate current for cooking while a number of devices of surprising utility and variety may be operated throughout the house. These also include heating apparatus.



Depicting Method of Cooling Gasoline Motor Generator.

Charging the Electric Vehicle in the Private Garage with Current Supplied by Generating Set.

The installation of a gasoline-electric set makes possible the utilization of the pleasure or commercial electric vehicle, outside the usual so-called electric field, as with a controlling panel and rheostat the batteries may be provided with energy. The controlling panel is equipped with fused switches, ammeter, voltmeter, and polarity indicating lamps, for controlling one or more circuits as desired. It is also provided with brackets for wall mounting.

The charging rheostat may be placed under the controlling panel or on the wall adjacent, so as to take up minimum space and insure the utmost convenience in controlling the current. The device is enclosed by an easily removable sheet metal cover, which effectually prevents accidental contact with live parts of the circuits. The function of the rheostat is to prevent a heavy rush of current through the batteries when the latter are connected to the source of supply, as well as to regulate the flow of the electricity. The panel is equipped with circuit breaker, fused switch and reliable instruments and is also provided with pipe supports for mounting. With such an arrangement it is claimed that the electric vehicle may be charged easily, the operation involving no labor whatsoever.

Relative to the costs of installation and operation the General Electric Company points out that as with automobiles, so it is with generating sets, the one that can be purchased for the least money is not usually the least expensive in the end. If figured on the basis of dollars a cubic foot occupied or dollars a pound, or even dollars a kilowatt output, the sets are high priced, but on the basis of dollars a unit of reliability the prices are no higher than one would expect for an article of this nature. The cost includes all accessories to the generating apparatus but not auxiliary apparatus, such as switchboards, fuel and water tanks. batteries, etc.

In estimating the cost of operation of such a plant the company calls attention to the fact that all items of expense should be considered, such as repairs, cost of attendance, depreciation, cost of suitable building, etc., as well as that of fuel and lubricant. The higher the quality of the apparatus, the lower will be the items of repairs and depreciation; the more automatic the operation of the apparatus, the lower the cost of the attendance; and the more compact the design, the less the cost of installation and space occupied.

In figuring the cost of fuel, account should be taken of the fact that any gasoline engine driven set will supply more electrical output a gallon of fuel consumed when operating at its normal rated load, whereas in most cases apparatus of this nature is usually operated at only a fraction of its full capacity. Therefore, a piece of apparatus that will operate at but slight increase of fuel consumption a unit of output and fractional loads, is more economical than one that will consume practically as many gallons of fuel an hour on small as on full loads. The General Electric motors are so designed that a reduction of load results in a definite decrease of fuel consumed, the amount of fuel a kilowatt output increasing but little as the load is reduced.

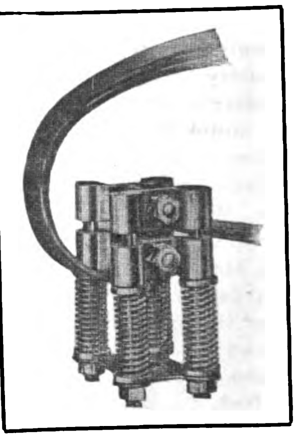
LENOX ANNUAL MEETING.

At the annual meeting of the board of directors of the Lenox Motor Car Company, Boston, June 3, a vote of thanks was tendered to Frank A. McClasky, the treasurer, for his work as general manager during the past year, and he was unanimously re-elected to that position. Among several important matters which were decided upon were the following: Declaring the regular semi-annual dividend to stockholders of record; the production of a six-cylinder Lenox car for 1913, and the erection of a larger plant. A committee was chosen for the purpose of selecting a site for this factory, and it is hoped that the company will be in its new home by Jan. 1.

VELVET AUXILIARY SPRINGS.

Motor car springs which provide comfortable riding qualities on smooth and level highways may jar and jolt the passengers when the machine is operated over rough roads at varying speeds. To eliminate all vibration and shock these stresses must be absorbed in such a manner that there is no recoil.

A device which has been tested and thoroughly tried out is the Velvet auxiliary spring for which George Sumner, Inc., New York City and Boston, is distributor. This differs from the usual form of shock absorber construction inasmuch as the rear of the car is practically suspended by eight elastic coils which are so designed that there is no side sway.



Velvet Auxiliary Spring.

As outlined in an accompanying illustration, it will be noted that two sets of block members are employed, one of these being bolted to each portion of the spring. One set of blocks slides freely up and down on studs over which are fitted the auxiliary springs and a plate is utilized to space the studs properly and to prevent binding.

The lower ends of the stud members are equipped with adjusting nuts, these permitting the regulation of the tension of the springs as desired. It is pointed out by the maker that no violent recoil is possible with the Velvet auxiliary springs as the downward and upward movements are equally compensated. They may be attached easily in a few minutes, as boring or special fittings are not required.

THE PROTECTION OF A GUARANTEE.

Standard productions, whether motor vehicles or their equipment or accessories, are usually placed in the market with a guarantee for quality and service. The producers do not give uniform protection and the conditions differ widely. But there appears to be no hesitancy to insure the purchasers against poor material and faulty workmanship. There is abundant reason why this insurance should be given, and a very cogent influence with purchasers when they have a choice at approximate parity of cost is the character of the guarantee.

As the producer makes the guarantee it must naturally be assumed that he has stated a protection he is justified in giving, and as he undoubtedly has the right to change the conditions of sale at will there appears to be no reason why the guaranty should not be lived up to. Under ordinary circumstances there are sufficient prescriptions in the warranty to protect the producer from imposition, which is all that could be expected. When the requirements have been met by the purchaser it is the duty of the guarantor to accept a situation, whatever that may be.

The guarantee as a whole generally relates to repair. The reasonable purchaser merely desires the character of service that he should have, and as restoration is usually a logical adjustment of a defect or failure, he is justified in believing that expense incurred by him in connection with adjusting a claim legitimately made should be minimized. Where a repair is necessary outside of the insurance of the maker the cost should be as low as it could consistently be made.

There are those, however, who establish extremely high prices for parts and labor in connection with repairing, and seemingly accept such occasions as may arise as opportunities for making large profits. No one will maintain that work should be undertaken at a loss, but it is equally logical to assume that no advantage should be taken of a customer. Business judgment should dictate that it is wise to satisfy and retain a patron, especially where there is decided competition and when he is an influence in the market, but this principle is often lost sight of and a good customer sacrificed.

There is no question that situations arise from misunderstandings that could be avoided by exercising common sense. In the event of a repair requiring more work than might be believed, or a larger number of parts, it is practical for the manufacturer to communicate with the customer, stating the facts and estimating the expense, leaving the matter to the judgment of the owner. Where there may be a choice it is best to have a decision and eliminate all possibility of controversy. But where an article is returned to the maker under a guarantee, and a large bill is rendered for what may be regarded as work the producer is obligated to perform, in the absence of exact knowledge suspicion of imposition is natural.

Unquestionably there are those who will deliberately conceal their own responsibilities and make claims for adjustment that are absolutely without foundation of fact or reason. It may be difficult to discriminate between the legitimate and the illegitimate demands, yet no justification can be made of methods that are insufficient to effectually protect all at interest. The proportion of those who have sufficient claims for adjustment is large compared with those who have not, and those who guarantee and shirk their obligations, or take advantage of an opportunity to create an expense that is not in every way warranted, must be the losers.

The market is increasing rapidly and the competition is relatively keen, and no person or firm has such control of a product as to be able to dictate to the buyers. Lack of business courtesy or dereliction of obligations are two of the greatest stimulants for a competitor to take advantage of, and while one can overlook a mistake or error there are few who will lost sight of imposition.

PUBLICITY IN SPECIALIZED MEDIUMS.

There are those who, seeking the greatest volume of publicity at the least expenditure, and guided by the application of a single principle, accept the general magazine as a vehicle that will be especially productive. Advertising is the greatest commercial problem of the day. To produce the finished notification to the public is an art. To make a successful campaign of promotion is a science and such undertaking depends entirely upon the knowledge of the needs of the people, the possibilities of the market and the choice of the mediums for informing the public.

The general magazines of today have extremely large distributions. They are neither sectionalized nor specialized, and assuredly ought to appeal equally to the people wherever sold. Examination, however, will establish the fact that these publications are created as a rule to deal with fiction and special subjects in which there may be some degree of concern, but there is nothing to impel interest other than continued stories, the value of which is relatively unimportant. With very rare exceptions do these prints present articles which in any way relate to the industries or the commercial enterprises bestowing advertising patronage. The editorial sections are limited and the publicity pages are variable with the demands upon them. Nothing is promotive of trade.

Such publications seldom index the advertisement sections. These are left for the reader's casual examination. Nothing impels attention save curiosity. The merit of some advertisements may command inspection, but at best this is incidental. Once the pages are scanned there is no reason for retention. With an article of general consumption or use the magazine of the character stated no doubt reaches a large number of possible purchasers with reference to the circulation, but where there are limitations to demand it is not to be assumed that this ratio is preserved, although the cost for the service is based on the advertising value as applied to the commodity in practically universal use.

In these publications the man who wishes to reach the limited number of the total distribution that might be interested in his or a similar production pays the same price as he who appeals to all readers. When those who are concerned in the proposal are eliminated from those who are not, and the real prospects are disclosed, the number will be found a surprisingly small percentage of the total. The cost is as large proportionately as the probable purchases are few. Considered from any viewpoint the proposition is the same, although there may be many different ratios and differing values with each instance analyzed.

It is not to be assumed that all publicity can be placed directly before those who will purchase, but it is entirely reasonable to make direct appeal to a class that constitutes a market for a product. To illustrate, the Automobile Journal is devoted to the owners of motor vehicles. More than 90 per cent. of its subscribers are actual possessors of cars. These men have large influence with their friends, who are enthusiastic of and are keenly interested in automobiles. This publication is given over to every phase of the use of motor vehicles. It is dependable in its information and it specializes subjects that are material and increase the value of the service of the machines, this in turn benefiting the people as a whole. As every subject relates to the automobile it will be understood that these, with discussions and reviews, with digests and descriptions, have a decided value. Naturally publicity in such a magazine must reach the class to which it is especially directed.

The Motor Truck is the most comprehensive print of the kind published in America. It is generally promotive of service wagon use. It takes up and deals with differing enterprises, the conditions to be met with each, the methods employed, the work accomplished by animal conveyances and the economies with motor transports, analyzing haulage problems and reaching conclusions that are invaluable to those employing highway transportation. It is read because of the distinct merit and worth of the contents. It is specialized for the benefit of those who have no other means of information, who realize that business requirements demand that they possess every fact that can be applied with profit, and that they guard against every error. Its distribution is not to casual readers, but to those who are constant in their attention and to whom it is valuable.

The Accessory and Garage Journal is a trade publication in every sense. It is a means for systematically distributing industrial intelligence that is to be found in no other form. Its subscribers are the active interests in the industry and trade, who value it because of the character and quality of information that it contains. It is equally serviceable as a reference. It is retained and consulted because of the reliability of its facts and data. It is a print that has a distinct place and has prestige with the business interests. It is read with deep interest because it is a business man's magazine. Its readers are those with whom business can be transacted, who know the merits of a proposition, and who are ever alive to opportunities offered to them. There could be no better class than this to reach—not those who make individual purchases, but those who buy in quantity and who, as direct representatives, promote and stimulate the market in which they are influences.

In these magazines, with distinct fields, there is no uncertainty with publicity. Each serves a definite purpose and unitedly reaches a very large proportion of those who would be concerned in any phase of the market and the industry. No more potent factors could be obtained, and when the expense is ascertained it will be found trifling when compared with the cost for similar service in publications characterized as general.

VALUE OF SPECIALIZED MAILING LISTS.

The statement relative to the circulation of the Accessory and Garage Journal and the value of the publication as a vehicle of publicity, has been productive of the criticism that, with certain enterprises, mailing lists were maintained that were larger in number of addresses than guaranteed distribution of the magazine. In statement that has been issued concerning the Accessory and Garage Journal it was maintained that it reached the executive of every concern of business actively engaged in buying and selling identified in any manner with the automobile vehicle and allied industries. This fact is reiterated and emphasized as being absolutely correct. There is no pretense made of reaching those interests that buy raw material and manufacture stock, as sheet brass, for instance, or bar metal, or lumber, or the like, offering this to the open market and selling it as standard production. Neither is there attention given to those who purchase such stock and manufacture standard tools, to illustrate, such as saws, hammers, vises, etc., that are not specialized. But no one is neglected who in any manner produces what can be utilized in the manufacture of motor vehicles or their equipment, and every one engaged in the distribution or sale of the machines, of accessories, supplies and parts, in the conduct of garages and public service stations and repair shops is reached by the magazine.

The individual mailing list, no matter how many addresses compose it, is not entirely a trade proposition. The largest business existing may have a collection of names of impressive proportions, but the mere matter of numbers does not indicate its value. As a matter of fact one of perhaps half the total might be more productive of results. The addition of names to a list is no indication that the publicity distributed will produce a larger return. Everything depends upon the persons named. They may have decided interest, or none whatever. Every business has its own direct representatives, and these supply, to a considerable extent, information on which the mailing list is based, but this is incidental and is not their principal duty. The person who receives publicity in which he is not interested does not notify the sender. The matter is thrown aside and its usefulness has never been realized. There is no manner of verification of the business prospects when a name is received. It is merely the matter of a single copy and no attention is given to it. The mailing may go on for years.

There is no better manner of judging the value of mailed publicity than from one's own experience, and the estimate one places upon it. Unless directly interested one's concern is casual. Costly catalogues and booklets are not so generously distributed. These go to those who are better known. Less expensive matter is given wider circulation, and so it is found that the systematically maintained mailing list is divided and there are selected series of names for differing purposes. Under any circumstances the list will contain "dead" names. Unless the postage is first class the mail is never returned, and usually it is too costly to pay for returning it.

The mailing list of the Accessory and Garage Journal is revised each day to the close of business. The magazine is not distributed with reference to a single business, but to all enterprises, and there is equal attention given to reaching all sections of the country and every market. Every copy is mailed with the request that it be returned if not delivered, and the postal regulations require that the publisher be notified of every change in address, two conditions that make it possible to follow each copy. This impels attention to "dead" distribution.

The magazine is created to interest its readers. It is a vehicle for publicity in that its contents impels its reading, and being devoted to the industries and the trade it directly concerns those who receive it. It has qualities that demand its preservation. It is retained as a reference. It is valuable not only to the buyer, but to every individual associated with him. It is not limited to a class or classes. It is published for the benefit of the entire industries and the trade and it reaches those who are the controlling influences direct.

No comparison can be made of the service of the Accessory and Garage Journal and a private mailing list that does not emphasize its superiority in no uncertain manner. But this is from the point of number of actual buyers reached. When expense is considered and the magazine is understood to be at parity with first class mail, it will be understood that the saving is from 75 to 90 per cent. of the cost of circularizing or any manner of distributing publicity. It should be clear to every person that this means a service of unquestioned superiority and a saving that is positive.

The publisher of the Accessory and Garage Journal realizes that the quality and character of its distribution must be the highest. Neglect means deterioration and loss. To maintain it is the greatest care. Not to do so is plainly sacrifice. Under any circumstances to maintain a private mailing is incidental. It can be and often is slighted. Were business absolutely dependent upon it there would be a different degree of attention.

PRICE CUTTING AND ITS CONSEQUENCES.

When an article or commodity is bought in the market the value is generally the price paid by the purchaser. If the cost be less than the standard charged it is assumed that the loss is sustained by the producer or by the dealer and that there is a gain by the buyer to the extent of the difference. There is, however, generally an excellent reason for a reduction in price. But whatever the cause it must be obvious that unless this is well known the original value is discounted and with some it is impossible to restore confidence in the merit and quality as it first obtained.

One of the first results of competition ought to be a better or improved production with no change in the cost. It is not wise to make sacrifice of what has been established at perhaps large expense and long endeavor, and it is not practical to reject the subject and begin all over again. The one would mean a loss simply incalculable, the other the destruction of a business because of the activity of competitors.

When a price has been cut the result is the temporary attraction of those who may have understood the worth of the product, and perhaps a temporary increase of the volume of transactions, but there cannot be otherwise than a feeling by the buyer that there is cheapening of quality or that the article is not what it is represented to be. The condition, it must be understood, is not governed by the public. It depends entirely upon the manufacturer or his selling agents. Of course it is possible for the former in his associations with his representative to obviate all possibility of price making, and if he does not do so primarily he is at fault. Should he make such restrictions then he has a legal remedy in the event that these are not observed.

Price reductions may be logical when there is a lessened demand for an article and there is a surplus stock that must be converted into money. But where there is one instance of this character there are hundreds where individuals without reflection, and without knowledge of the probable consequences, sacrifice their own business interests because of a belief that it is their own concern if they wish to sell their property at a less price. Assumedly it is a manifestation of business capacity, when as a matter of fact no man should so heavily stock that he will have an unsalable line in his store.

A reduction in any line not protected by the manufacturer is unwise from any point of view. In the event of there being no change in the selling price whatever profit is lost must be suffered by the dealer. Bargain hunters are not desirable patrons from the fact that they are influenced by motives which will attract them to any store and courtesies and attention are lost upon them. They are not influenced by the substantial reason of satisfaction. Their custom is casual at the best and naturally there is a lessened profit in it. It should be considered that it costs just as much to sell something at a loss as at a profit, and that the advertising value of such sales is worthless unless they are continued.

Price wars are ruinous from the standpoint of business success. They accomplish nothing and invariably result in loss to those engaging in them. There may be a temporary advantage for the purchasers, particularly if the basis of the competition is a stable supply, such as gasoline, and yet with a mistaken conception of business preservation men will cut prices simply because a competitor does so. It is strange so few realize that what is desirable because of a lessened price ought to be reasonably salable at the original figure. A reduced value cannot be constantly maintained with a standard article, and when a new price is fixed it becomes, under such circumstances, a mere matter of legitimate competition.

Few business men can afford to voluntarily reduce their profits. These are ordinarily limited by competition, and where they are required to specially advertise reductions there is additional loss. Where a limited quantity of stock may be offered exclusively, and can be profitably sold, is an entirely different proposition, but such a condition is not discussed. The statements are applied to those who are inclined to parallel their businesses with the average department store and believe that the methods of the latter can be successfully imitated.

CANADIAN BODY COMPANY.

The Fisher Body Company, Ltd., has been organized in Canada and will manufacture automobile bodies of aluminum, steel and wood. The new concern is capitalized at $150,000, and has purchased a plot of ground in Walkerville, Ont., on which will be built a plant which will have a capacity of upwards of 100 bodies a day. The incorporators are F. J. Fisher, L. Mendelssohn and A. Mendelssohn, who constitute the Fisher Body Company and the Fisher Closed Body Company, both of Detroit.

MICHIGAN CENSUS RETURNS.

The rapid growth of the automobile industry in the State of Michigan from 1904 to 1909 is shown in a recent report of E. Dana Durand, director of the 13th census. The increase in value was much greater relatively than that in number. Compared with 33 establishments in 1904 there were 113 in 1909, while the average value a machine in 1909 was $1086 as against $718 in 1904.

The entire value of automobiles produced in 1904 was $6,552,804, and in 1909, $70,359,749. The value of all other products reported, which, for the most part, represents the value of automobile bodies and parts turned out by establishments engaged primarily in that branch of manufacture, increased even more rapidly than that of the complete machines. This item was $1,443,730 in 1904 as compared with $26,291,702 in 1909.

The increase in number of cars produced during the five-year period, their value and other points of interest concerning the growth of the industry, is set forth in the following table:

	1904		1909	
	No.	Value	No.	Value
Buggies, runabouts and touring cars	9023	$6,481,164	62,319	$64,940,793
Limousines and cabs	*	....	1,560	3,825,066
Service vehicles	*	....	146	273,108
Delivery Wagons	51	35,250	401	319,071
Trucks and all others	51	36,390	374	1,001,711
Other products, including bodies, parts and repair work	...	1,443,730	....	26,291,702
Totals	9125	$7,996,534	64,800	$96,651,451
Gasoline cars	9114	6,537,404	64,262	69,130,223
Electric cars	11	15,400	538	1,229,526

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*Not reported.

The growth of the industry is shown in another manner as follows:

State of Michigan.

	1904	1909
Number of establishments	33	113
Persons engaged	2,953	28,098
Proprietors	17	29
Salaried employees	201	2,625
Wage earners	2,735	25,444
Primary horsepower	1,800	25,938
Capital invested	$4,347,000	$52,926,000
Salaries paid	236,000	2,570,000
Wages paid	1,268,000	15,491,000
Cost of materials	3,443,000	53,882,000
Value of products	7,997,000	96,651,000
Value added by manufacture	4,554,000	42,769,000

City of Detroit.

	1904	1909
Number of establishments	19	68
Persons engaged	2,191	17,437
Proprietors	12	*
Salaried employees	145	1,762
Wage earners	2,034	15,675
Primary horsepower	*	14,666
Capital invested	$3,447,000	$28,928,000
Salaries paid	168,000	1,781,000
Wages paid	959,000	9,621,000
Cost of materials	2,631,000	31,363,000
Value of products	6,240,000	59,536,000
Value added by manufacture	3,609,000	28,173,000

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*Figures not given.

GOODYEAR ADDS TO CAPITAL.

Within the past month several well known tire concerns have increased their capital stock and otherwise provided for additional production. Among the latest to make an announcement of this nature is the Goodyear Tire & Rubber Company, Akron, O., which has increased its capital from $6,000,000 to $15,000,000. Part of the money will be utilized in making improvements and extensions of the factory facilities.

NEW TIRE PLANT.

Following the announcement by the United States Rubber Company, New York City, of an increase in capital stock from $75,000,000 to $120,000,000, comes information from the United States Tire Company, that plans are under way for the erection of another plant, which is expected to have the largest output of any factory of its kind in the world. The two projects—that of increased capitalization and that of another factory—go hand in hand, the latter, in a way, being dependent upon the former.

The United States Tire Company is now operating four immense tire plants, these being located at Hartford, Conn., Detroit, Mich., Providence, R. I., and Indianapolis, Ind. The daily output runs into the thousands, yet such has been the demand that additional production facilities are deemed necessary.

J. M. Gilbert, general manager of the United States Tire Company, says the proposed new factory will increase the company's output about 5000 tires daily. At present, by working eight-hour shifts in all the plants and utilizing all available equipment, the company is barely able to care for its trade. The new factory, besides being the largest of its kind in the world, will be equipped with the most modern machinery known to the industry. Information concerning its location is to be made public soon.

SEEK LION FACTORY.

Soon after the disastrous fire, which destroyed the factory of the Lion Motor Car Company, maker of Lion cars, in Adrian, Mich., June 2, the officials of the company received a tempting offer from the Chamber of Commerce in Detroit. It would appear, however, that there is some doubt about the acceptance of the proposition, since several business men in Adrian have decided to raise $100,000 in additional capital in an effort to induce the concern to remain in that city.

ANOTHER NEW CAR.

It is understood that Dodge Bros., Detroit, formerly engaged in the manufacture of motors and gears utilized in Ford cars, is about ready to announce the production of pleasure and commercial vehicles, experimental machines having been tested out on the roads of that city and vicinity for a number of weeks. Frederick J. Haynes, until recently factory manager of the H. H. Franklin Manufacturing Company, Syracuse, N. Y., is said to have been engaged in a similar capacity with the new enterprize. Detailed plans will be awaited with interest.

STUDEBAKER CANADA BRANCH.

The organization of the Studebaker Corporation of Canada, Ltd., the Canadian representative of the Studebaker Corporation, has been completed, and Frank E. Fisher appointed as manager. He is a Canadian, and well acquainted with the people and geography of the country, and has had considerable experience with the Studebaker companies, so that he is particularly well fitted for the position. He has been placed in entire charge of the Canadian business, which centres at the plant at Walkerville, Ont.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Hassett & Rogers, Inc., Amesbury, Mass.; to manufacture automobile bodies; $18,000; incorporators, J. H. Hassett, C. H. Hassett, George H. Collins.

Standard Auto Sales Company, Philadelphia; $10,000; incorporators, R. M. Snyder, C. H. Friars, E. H. Weaver, 717 N. Broad street, Philadelphia.

Acton Tire Repair Company, New York City; $3000; incorporators, Patrick Curry, William Koopman, Lawrence Kerrigan, 759 Seventh avenue, New York City.

Simplex Aluminum Solder Company, Inc., New York City; to manufacture aluminum solder; $25,000; incorporators, C. B. Erkens, 255 West 143rd street; Charles Decker, Henry Bender.

Eiseman Automobile Company, Cleveland, O.; $10,000; incorporators, S. N. Weitz, J. W. Campbell, Harry Pott, H. C. Cummings, Alvin Boehmer.

Automobile Resilient Tire Filler Company, Indianapolis, Ind; $10,000; incorporators, W. H. Disher, A. C. Balfour, Jessie Moffat.

Merchants Motor Service Corporation, Philadelphia; incorporators, G. B. Teaz, William Voss.

White Automobile Company, Indianapolis, Ind.; $2000; incorporators, R. D. Eaglefield and G. W. Fuller.

Pitt Motor Truck Company, Pittsburg, Penn.; $20,000; to manufacture motor trucks; incorporators, J. E. Douglass, W. S. Phillips, F. O. Brandt, J. E. McCalmont.

Eckberg & Place Garage Company, Fall River, Mass.; $7000; incorporators, V. J. Eckberg, Ernest Place, Robert Place.

Lansden Electric Vehicle Company, Boston; $5000; incorporators, A. B. Freeman, Gardner Freeman, William H. Britton.

Storage Battery Safety Lamp Company, Wilmington, Del.; $550,000; incorporators, George Washington May, Artemas Smith, M. E. Dorsey.

Todd Rubber Company of New London, Inc., New London, Conn.; $2000; incorporators, E. J. Todd, Alfred Wurts, A. P. Gunn.

Todd Rubber Company of Waterbury, Inc., Waterbury, Conn.; $2000; incorporators, E. J. Todd, F. H. Potter, A. P. Gunn.

Blue Ribbon Garage Company, Springfield, Mass.; $2000; incorporators, Harry Bland, Albert Karp, J. G. Gottesman.

Jiffy Auto Curtain Company, Chicago, Ill.; $100,000; incorporators, Frank H. Ilse, 1505 Michigan avenue, Chicago.

Smart Auto & Manufacturing Company, Indianapolis, Ind.; $50,000; to manufacture automobiles and parts; incorporators, O. S. Schrader, D. W. Reed, I. H. Shelton.

Suburban Equipment Company, New York City; $10,000; incorporators, Harrison Gray Otis, 2 Rector street; W. L. Otis, Charles A. Braker.

Ball Bearing Novelty Company, New York City; $6000; incorporators, A. B. Greenberg, 874 Longwood avenue, Bronx; Alfred Pioneer, Jacob Solomon.

Randolph Motor Truck Company of Delaware; $100,000; incorporator, I. B. Lipson, 105 West Monroe street, Chicago, Ill.

Eadie Vehicle & Gear Company, Buffalo, N. Y.; $200,000; incorporators, John M. Eadie, George P. Keating, Seward H. Millener, William J. Donovan, Howard G. E. Smith.

Mitchell-Edmondston Garage, Inc., New York City; $10,000; incorporators, Liland A. Mitchell, George W. Edmonston, Joseph P. Bickerton.

Kingsbury-Leahy Company, Albany, N. Y.; $40,000; to deal in automobiles and motorcycles; incorporators, J. S. Kingsbury, S. M. Kingsbury, E. W. Leahy.

Pennsylvania Automobile Company, St. Louis, Mo.; $10,000; incorporators, William A. Fortner, Claude G. Fordran, George P. Burleigh.

Charter Automobile Company, Baltimore, Md.; $75,000; incorporators, C. R. Fouts, W. E. Byrd, G. H. Reinhardt.

Pembroke Manufacturing Company, Rochester, N. Y.; $50,000; to deal in and manaufacture automobile parts and accessories; incorporators, Charles J. Pembroke, Winfield P. Pembroke, Walker J. Fellows.

Etchell Auto Company, Biddeford, Me.; $10,000; incorporators, Arthur L. Roberts, Joseph Etchells, Charles V. Tanner.

Wetherbee Bros. Company, Arlington, Mass.; $20,000; incorporators, Ivers L. Wetherbee, Clarence A. Wetherbee, A. Ingham Bicknell.

Punctureless Tire Company of Massachusetts, Boston, Mass.; $15,000; incorporators, William E. Riddell, J. Hiram Smith, Frank H. Jenkins.

Guide Motor Lamp Manufacturing Company, Cleveland, O.; $100,000; incorporators, H. J. Monson, W. F. Persons, W. H. Bunce, J. D. Kauffman, W. L. Rose.

Hampton Manufacturing Company, Indianapolis, Ind.; $5000; to manufacture accessories; incorporators, S. B. Nussbaum, Sol Allman, William Hampton.

Diamond Motor Car Company, Pelham Manor, N. Y.; $10,000; incorporators, C. W. Rundell, C. W. Jaycox, Frank Davis.

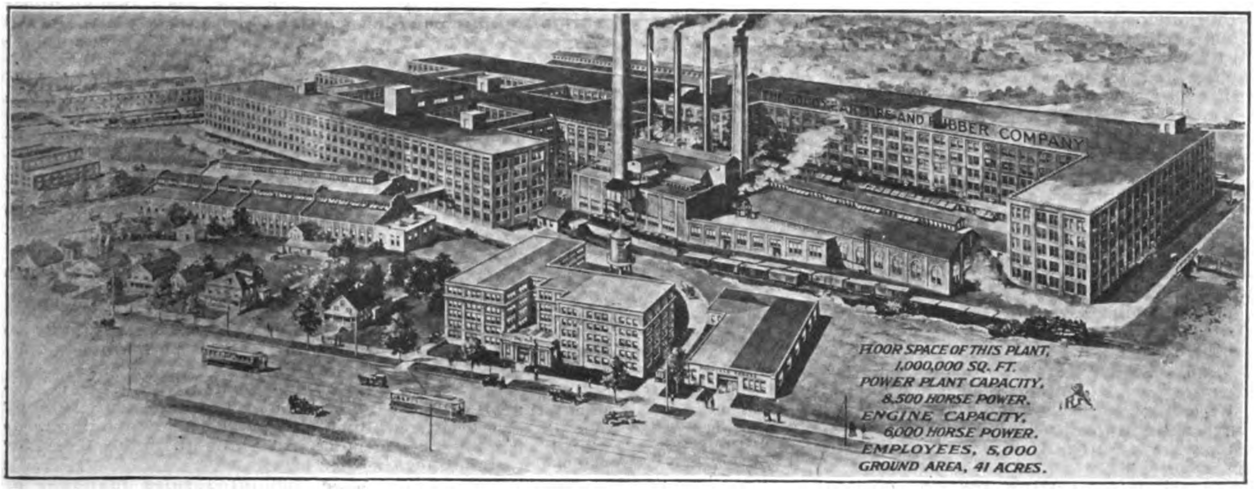
Automobile Fault Finder & Anti-Forgery Electric Pen Company, New York City; to manufacture automobile accessories; $50,000; incorporators, P. H. Couty, D. D. P. Ghadiali, Henry Weinberger.

Ceylon Filler Company of New Jersey, Camden, N. J.; $3000; incorporators, H. L. Merrick, J. A. Kinney, William Williams, T. W. Shore.

Mandel-Frisch Auto Repair Company, Sioux City, Ia.; $5000; incorporators, A. J. Mandel, August Frisch.

L. A. W.-Carburetor Company, New York City; $100,000; incorporators, N. Leinau. S. Heineman, H. A. Watkins.

Smith Bros. Garage, Inc.; Melrose, Mass.; $1000; directors, Rufus W. Smith, Rufus W. Smith, Jr. L. A. Smith.


AND RUBBER COMPANY
FLOOR SPACE OF THIS PLANT, 1,000,000 SQ. FT.
POWER PLANT CAPACITY, 8,500 HORSE POWER.
ENGINE CAPACITY, 6,000 HORSE POWER.
EMPLOYEES, 5,000
GROUND AREA, 41 ACRES.

Latest Photograph of the Goodyear Tire & Rubber Company's Plant at Akron, O., Showing New Administration Building and Garage.

Blaisdell Automobile Company, Dexter, Me.; $25,000; to deal in automobiles and supplies and conduct repair shop; incorporators, Charles R. Blaisdell, Ernest D. Blaisdell.

Vanderheyden Garage Company, Troy, N. Y.; $5000; incorporators, Fred E. File, 18 Hoosic street, Troy; William G. Pike, Eleanor M. Pike.

Brooklyn Delivery Company, New York City; $2000; to conduct automobile delivery; incorporators, M. A. Lynch, 109 W. 82nd street; Charles E. McMahon, E. S. Lucas.

Yonkers Auto Repair Company, Inc., Yonkers, N. Y.; $1000; incorporators, Herman Flader, Albert Kipfer, Elizabeth Kipfer.

Bayside Taxicab Company, Bayside, N. J.; $5000; incorporators, William Wagner, Charles B. Story, Charles Bonner.

Consumers' Rubber Company, Providence, R. I.; to manufacture and deal in rubber goods; $600,000; incorporators, P. W. Gardner, A. L. Churchill, E. Butler Moulton.

California Co-Operative Motor Company, Long Beach, Cal.; $150,000; incorporators, Joseph J. Mottell, W. H. Benette, S. H. Underwood, George A. Spicer.

The Bergdoll Car Company of Missouri, Camden, N. J.; to manufacture and deal in motor cars; $10,000; incorporators, Frank R Hansell, John A. MacPeak, C. U. Martin.

P. & A. Non-Metallic Oilless Bearing Company, Wilmington, Del.; $50,000; incorporators, E. E. McWhiney, William J. Maloney.

Never Puncture Tire & Tube Company, Wilmington, Del.; $1,500,000; incorporators, E. E. McWhiney, William J. Maloney, Norman P. Coffin.

Standard Engineering Company, Belfast, Me.; $10,000; to manufacture and sell automobiles and supplies; incorporators, A. W. Keating, Maurice W. Lord.

National Auto Specialty Manufacturing Company, Tama, Ia.; $10,000; incorporators, E. E. Harlan, John Pitka, L. L. Hufford.

A. S. Lee Company, Providence, R. I.; $5000; incorporators, Daniel J. Healy, H. Ladd Walford and G. Otis Washburn.

Republic Motors Company, Brooklyn, N. Y.; $2000; to deal in automobiles and motors; incorporators, Stephen C. Frere, Ernest J. Ellenwood, W. J. Maloney.

Presto Inter Rim Company, Portland, Me.; $200,000; incorporators, M. A. Thurston, H. P. Sweetser.

Como Automobile Supply Company, Charlotte, N. C.; $50,000; incorporators, Morehead Jones, C. C. Coddington, Mrs. M. M. Jones, Mrs. M. L. Coddington.

V. C. Motor Truck Company, Kittery, Me.; $100,000; incorporators, Horace Mitchell, C. E. Smothers, William E. Sisk.

Ford Auto & Truck Company, Inc., Clarendon, Va.; $25,000; incorporators, E. H. Bauer, W. W. Barnes, R. Gordon Finney.

North Jersey Auto Supply Company, Inc., Newark, N. J.; $80,000; incorporators, Max Permission, 525 18th street, Newark; A. C. Mohrof, C. G. Butler, F. W. Mead.

Broadway Penn Garage, Inc., Brooklyn, N. Y.; $2000; incorporators, Herman Goldstein, 181 Penn street, Brooklyn; Meyer Kaplan, Hyman Maisel.

Gressler Aviation Company, New York City; $25,000; incorporators, W. Romain Gressler, 139 W. 37th street, New York City; W. R. Kip, Gerardus P. Herrick.

Briggs Oil Company, Long Beach, Nassau country, N. Y.; $1500; to deal in oils and greases; incorporators, William S. Driggs, Long Beach; Abraham Lodholz, Henry J. Frink.

Gotham Sporting Goods Company, New York City; $10,000; to deal in motorcycles, automobile supplies, etc.; incorporators, Benjamin Goodman, Henry Ephriam, Ben Stacy.

The Veitch Motor Manufacturing Company, New York City; $200,000; to manufacture motors, automobiles, motor trucks, etc.; incorporators, James S. Harris, Percival J. McIntosh, Charles H. Toy.

Northern Motor Car Company, Albany, N. Y.; $25,000; incorporators, R. Dudley Cannon, Arthur P. James, J. Somers McClellan.

Robert Stock Auto Spring Wheel Company, New York City; $300,000; incorporators, Robert Stock, Augusta M. Stock, Joseph F. Bokelman.

American Carburetion Company, New York City; $5000; to manufacture carburetors and parts thereof; incorporators, William H. Woolley, Albert G. Hubbell, James F. Bisselle.

The Walden Aeroplane Company, New York City; $10,000; incorporators, Joseph M. Gottesman, Henry W. Walden, Louis Green.

Audubon Auto Service Company New York City; $500; incorporators, Michael P. Caffe, Edmond Huerstel, Julius M. Ferguson.

Kirchner Motor Company, Poughkeepsie, N. Y.; $2500; incorporators, Otto Kirchner, Charles Kirchner, John E. Townsend.

Eastern Motor Racing Associotion, East Orange, N. J.; to manufacture automobiles and motorcycles; $50,000; incorporators, H. H. Picking, C. O. Geyer, F. E. Ruggles.

WITH THE MANUFACTURER

J. Murray Page, one of the popular men along San Francisco's automobile row, has been appointed manager of the factory branch which the Locomobile Company of America, Bridgeport, Conn., is to establish in Los Angeles, Cal.

C. B. Thomas, formerly with the Studebaker Corporation, has become identified with the Metzger Motor Car Company, Detroit, as special travelling representative. Frederick Wade, who was also with the Studebakers, has become purchasing agent of the Metzger company.

R. A. Weinhardt, formerly mechanical engineer of the Hener Manufacturing Company, has joined the Continental Motor Company, Detroit.

The Jeffery-De Witt Company, Detroit, recently received an order for 1000 spark plugs from England.

The Cartercar Company, Pontiac, Mich., maker of Cartercars, is now running night and day in order to keep up with orders.

The Juno Motor Truck Company, Juneau, Wis., has been reorganized and new officers elected as follows: President, L. C. Pautsch; vice president, Theodore P. Hemmy; secretary, Henry A. Henning; sales manager, William McDougall.

The Olds Motor Works, Lansing, Mich., has leased a lot in Boston, at the corner of Commonwealth avenue and Cummington street, upon which will be erected a three-story building of reinforced concrete with a floor area of 26,000 square feet. It will be occupied by the Oldsmobile Company of Massachusetts, the New England representative of the Olds Motor Works, and will be operated as a sales and distributing house, with a complete service department in connection.

The Bower Roller Bearing Company, Detroit, is enlarging its plant considerably in order to take care of increased business. Contracts have been placed for new machinery and equipment to cost $50,000.

The Standard Roller Bearing Company, Philadelphia, recently installed new machines at a cost of over $100,000. This move was made necessary to take care of the rapidly increasing business of the company.

The Reslilo Tire Filling Company, Elmira, N. Y., has secured a plant at First and State streets, where it will manufacture a tire filling compound. George B. Wilcox has been secured as superintendent.

The Matheson Automobile Company has opened a temporary establishment in Philadelphia, at 203 North Broad street, in charge of B. M. Westerman. A permanent factory branch is to be established in that city.

The Eagle Company, Newark, N. J., has discontinued the manufacture of Standard Friction and X-L windshields, and sold its entire stock of those shields to Charles Weidman, New York City. This move was made because the factory space was needed for other manufacturing The company is to confine itself to the Eagle Rain-Vision shield

Hall's Garage, 131 Clinton street, Wausau, Wis., has taken the agency for Truffault-Hartford shock absorbers and other products made by the Hartford Suspension Company, Jersey City, N. J., and in keeping with the policy of the latter concern has established an attaching station in connection with the regular garage business. The building, which is devoted to the needs of automobile and motorcycle owners, is shown in an accompanying illustration.

The Goodyear Tire & Rubber Company, Akron, O., has completed the additions to its factory, which now presents the appearance depicted in an accompanying illustration. Two of the new structures were the administration building and garage. The entire plant has a floor space of 1,000,000 square feet and affords employment for 5000 persons. The business of the concern is handled by 66 direct factory branches in the United States and Canada, in each of which the service system is an important feature. In addition there are a large number of agencies, each of whom is given liberal support by the home office.

The Abbott Motor Company, Detroit, has purchased a plot of land along Beaufait avenue, to the north of the present factory, and is to erect new buildings which will enable a 25 per cent. increase in the output of the company during the coming year.

The Motz Tire & Rubber Company, Akron, O., has opened a branch in Cleveland, O., at 2352 Euclid avenue, in charge of C. R. Serfoss. This move was made necessary by the increasing business of the company in that locality, the Motz cushion tire proving quite popular with Cleveland motorists.

The Goodyear Tire & Rubber Company, Akron, O., reports that its 1911 sales exceeded the sales for 1910 by 500 per cent., tire equipment for 102,250 cars being produced. This year the company plans to make tires for 250,000 automobiles.

E. C. Howard has been appointed sales manager of the Cadillac Motor Car Company, Detroit, succeeding E. R. Benson, who resigned to join the Studebaker forces.

The Federal Rubber Manufacturing Company of Milwaukee, Wis., is planning a six-story addition to its plant at Cudahy. The building will be 400 by 100 feet, and will give the company double its present capacity. The total floor space now occupied is 170,000 square feet. From a payroll of 38 men last July, when the Cudahy plant was taken over, the Federal company has increased its business, so that now it has a factory force alone of 428 men, which, with the sales force and engineering corps, brings the number nearly to 600.

W. W. Farnsworth, formerly with the Motor Wagon Company of Detroit, and before that with the Federal Motor Truck Company in the same city, has joined the Flanders Manufacturing Company, being connected with the advertising department.

The Cadillac Motor Car Company, Detroit, has secured John Calder, formerly with the Remington typewriter, who will assist in the organization and production work.

Frank Smith, first assistant to Paul Smith in the sales department of the Studebaker Corporation, has resigned and it is rumored that he will shortly join the Metzger Motor Car Company.

Pratt, Carter, Sigsbee & Co., Detroit, has been experimenting recently with a single-cylinder truck of 800 pounds capacity. The car has been put through many long runs, and is to be shortly manufactured in a large factory which has been leased.

J. G. Phipps and C. W. Whitson, Detroit, have brought out a new electric with a 107-inch wheelbase. It is stated that manufacturing operations are to be commenced shortly.

The Hagstrom Bros. Manufacturing Company, Lindsborg, Kan., announces the addition of a new department for the manufacture of dies, tools, special machinery, etc., for the purpose of making the numerous specialties produced by this company.

The Continental Engine Company of Chicago is to move its plant to Dallas City, Ill., across the river from Burlington Ia. The company is also to be reorganized, Charles Barry, formerly with the Deering Harvester Company, and T. C. Mars, formerly with the Model Gas Engine Works, joining the organization.

The Belvidere Screw & Machine Company, Belvidere, Ill., has increased its capital stock from $100,000 to $200,000, in order to provide for expansion. Contracts have been awarded which will more than double the present factory, which is now running day and night on spark plug and other automobile work. The output for this year will reach the million mark in plugs.

The Brooks Manufacturing Company, Saginaw, Mich., has succeeded to the delivery wagon business of the Duryea Auto Company and is now engaged in the manufacture of light delivery wagons under the Duryea patents. The passenger vehicle business has been taken over by the Duryea Motor Company of Saginaw, which is headed by Charles E. Duryea.

The Long Manufacturing Company, Detroit, Mich., has sold its plant to the Cadillac Motor Car Company and will build a new factory, 270 by 120 feet, on a site which it has bought. Double the floor space of the old factory will be afforded, and the output of the company's radiators will be increased materially.

Wallace H. Robertson, brother of George H. Robertson, the well known racing driver, has joined the sales department of the Simplex Automobile Company, New-York City, maker of the Simplex.

The Stevens-Duryea Company, Chicopee Falls, Mass., is erecting a four-story brick and steel building 508 feet long, with frontage of 80 feet on Page boulevard, East Springfield. The quarters are to be used for the body building and painting departments.

H. N. Hovey and T. C. Starret of Detroit have secured the entire stock of the Simplex Motor Car Company, manufacturer of the Amplex car, with headquarters at Mishawaka, Ind., the 30 or more stockholders turning in their stock, rather than stand a pro rata assessment. Mishawaka people are hopeful that the action will save the concern for their town and that it will not be moved to Detroit as it was planned to do at one time. Operations will be continued on a small scale until reorganization. Present plans are to capitalize for $1,000,000.

John A. Graham, at one time superintendent of assembling and testing at the Brightwood Motor & Manufacturing Company of Springfield, Mass., was recently appointed engineer and superintendent of the Westfield Motor Truck Company, Westfield, Mass.

The England Manufacturing Company, maker of metal stampings and automobile accessories, formerly located in Amesbury, Mass., recently removed to Detroit, taking the old factory of the King Motor Car Company at 1559 Jefferson avenue.

The General Aluminum & Brass Castings Company is the name of a new concern which will erect a huge plant at Grand boulevard and St. Aubin avenue, Detroit, to manufacture castings and other parts for the automobile trade. Frank C. Root, who was identified with the Aluminum Castings Company, and capitalists from Detroit and Cleveland, will be identified with the venture.

The Bruns Automobile Company, Brooklyn, N. Y., has opened a new garage at New York and Atlantic avenues. This is one of the most modern buildings in the city, being completely equipped for the work of a service department.

Matthew B. Morgan, an automobile engineer, who has been with the Chalmers Motor Company of Detroit, Mich., for the past three years, has joined the Marion Motor Car Company force at Indianapolis, Ind. Morgan's experience, covering a number of years, took him through employment with the Peerless Motor Car Company of Cleveland O., Packard Motor Car Company of Detroit, Mich., and the Olds Motor Works, Lansing, Mich.

J. J. Cole, president of the Cole Motor Car Company of Indianapolis, Ind., for which the G. E. & H. J. Habich Company of Boston is the Massachusetts distributor, and William Colt of the Colt-Stratton Company, New York City, eastern distributor for the Cole, were recent guests of automobile men in Boston. Dinner was served at one of the leading hotels, following which there were interesting addresses by the guests and a number of Boston business men.

The Dayton Engineering Laboratories Company, Dayton, O., operates two factories, one of which is located in Chicago and the other in Dayton, O. The latter is presented in an illustration herewith. It is in this plant that the Delco self-starting and lighting systems are manufactured, while the ignition equipment is produced in the Chicago plant. The entire building shown is well fitted for the work, being equipped with all of the most modern machinery. A particular feature of the construction lies in the fact that the workmen are supplied with an abundance of light and special attention is paid to the matter of ventilation.

John F. Singleton, for the past six years advertising manager for the Firestone Tire & Rubber Company at Akron O., has organized the John F. Singleton Company and has opened offices in Cleveland, O. The new concern plans to conduct a general advertising agency business.

HALL'S GARAGE
MACHINE SHOP
BICYCLES
MOTOR CYCLES
TIRES
STORAGE
SUPPLIES

Hall's Garage, Hartford Suspension Service Station at Wausau, Wis.

The Blair Manufacturing Company, Newark, O., maker of the worm driven Blair truck, is now installed in its new factory, a general view of which is shown in an accompanying illustration. The plant is admirably arranged for this work, and is thoroughly equipped in the most up-to-date manner. Every modern manufacturing facility is incorporated for the rapid production of 1.5, 2.5 and 3.5-ton models.

The Union Motor Truck Company was recently formed in Sunnyvale, Cal., for the purpose of manufacturing and placing on the market commercial vehicles. The officers are: President, C. Y. Williams; vice president, Ernest Horstman; secretary, W. P. Buckingham; treasurer, Edgar Pomeroy. A large amount of new machinery will be purchased.

The Penn Motor Car Company has just completed the removal of its plant from Pittsburg, to Newcastle, Penn. All the machinery from Pittsburg, together with a large amount of new machinery, has been installed, and the company has resumed operations.

The Motor Manufacturing Company of Geneva, N. Y., is removing its plant to Dunkirk, and will occupy a part of the Lux Light plant in the latter city. The firm will employ about 100 men in its new plant.

E. D. Bangs of Milwaukee, Wis., is organizing a stock company for the purpose of manufacturing an elastic rim, perfected by Mr. Bangs, for holding solid tires on automobile wheels. Mr. Bangs announces that it will be at least a month before all the details of the new concern are completed. According to a statement by him the resiliency of the new device can be adjusted to suit any conditions.

GARAGE & DEALER

W. C. Durant recently arranged for the opening of branches of the Chevrolet Motor Company of Detroit, and the Little Motor Car Company of Flint, Mich., at Buffalo, N. Y. A large store has been leased and Joseph F. Rath has been appointed representative for the two companies in the district including Buffalo and surrounding territory.

The Urbana Automobile Company of Urbana, Ill., will erect an addition 100 by 50 feet to its garage. It will be of brick and concrete construction, and will give the company a floor space of 12,000 square feet. The garage is one of the best equipped and most finely appointed in the vicinity

The Seely Auto Sales & Training School of South Bend, Ind., will have new quarters at 232 North Michigan street, which will be among the finest of its kind in Indiana when completed. The basement will be used exclusively for training purposes, while the main floor will be utilized for garage and general salesrooms. Complete storage and recharging apparatus for electric machines will be installed.

Capt. F. W. Cole of the Pan-American Motors Company of San Francisco, Cal., has taken the agency for the Durable Dayton truck, built by the Dayton Auto Truck Company of Dayton, O. His territory will include California, Oregon and Nevada.

S. R. Smith has opened a new garage at 198 Church street, Poughkeepsie, N. Y. The building is a fine brick structure, and is up-to-date in every way.

F. L. Niell, well known to the automobile trade throughout the State of Pennsylvania, recently purchased the Auto Supply Company's business, conducted by Ross Leonard in Washington, Penn. He will continue the business at its present location, Main street and Highland avenue.

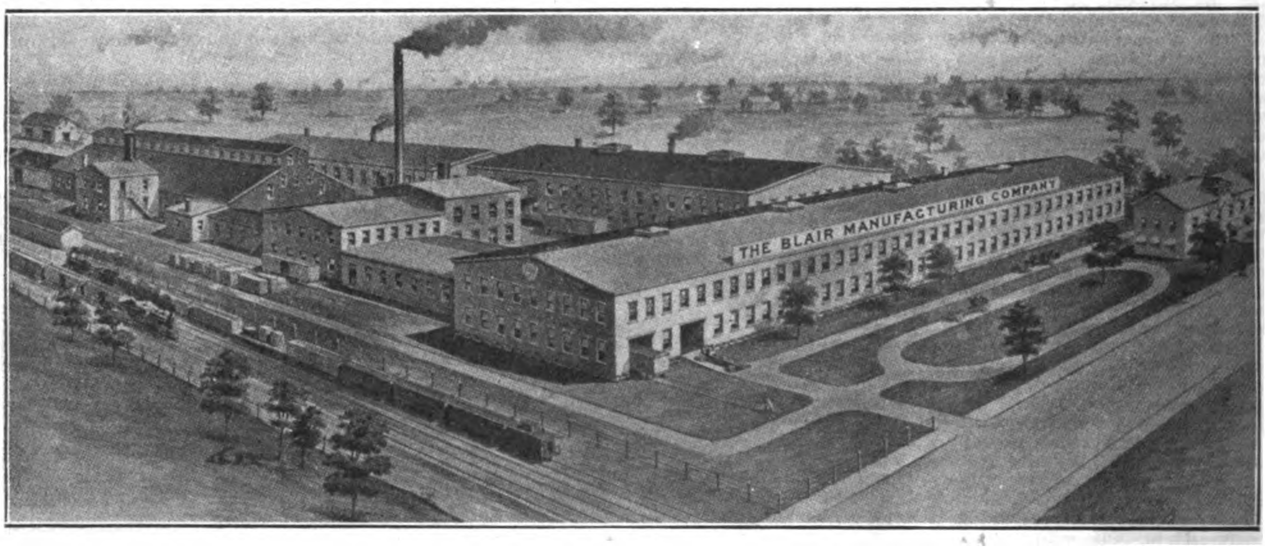
J. S. Fowler of Anderson, S. C., in addition to being one of the largest cotton growers in the United States, and also a big corn raiser, has established the reputation very recently of being the most successful automobile salesman in his state. During the last year he has sold $200,000 worth of machines.

Carl G. Fisher, president of the Indianapolis motor speedway, has taken the agency for the Packard car, made by the Packard Motor Car Company of Detroit, and has started the erection of a sales service building at Vermont street and Capitol avenue, Indianapolis. The structure will be one of the most complete of its kind in the Middle West.

W. K. Chetwood, who went to Portland, Ore., about a year ago from San Francisco, Cal., to represent the Kelly-Springfield Tire Company of New York City, has opened headquarters in a building at 328 Pine street. Mr. Chetwood is one of the best known men on the Pacific Coast, being familiar with the trade in all the larger cities.

The Sturdy Manufacturing Company of Chicago, maker of the Sturdy spark plug, has granted the Cedar Rapids Sales Company, Cedar Rapids, Ia., the exclusive sales right of its product in the State of Iowa. An office has been opened at Avenue A and Fourth street in the latter city.

The Enterprise Motor Truck Company was recently incorporated in Baltimore, Md. G. H. Nachman of the Enterprise Fuel Company, Hanover and Fayette streets, is one of the principal owners of the new concern. A contract for the erection of a garage at Oak and 20th streets has been awarded and the work will be commenced at once.



Plant of the Blair Manufacturing Company, Newark, O., in Which the Blair Worm Drive Trucks Are Produced in Three Models.

C. D. Warner has disposed of his automobile business, conducted for a number of years on Arsenal street, Watertown, N. Y, to Ralph Wise, Louis Mitchell and Fred Folger. Mr. Warner has had the agency for the Ford car, built by the Ford Motor Company, Detroit, Mich.

T. E. Smith, who has taken the agency for several makes of cars, is having a garage built at Ridgefarm, Ill. The new structure will be modern in every detail and will be strictly fireproof.

The Menard Company has opened a new garage on Division street, Holyoke, Mass. It has a capacity of 30 automobiles, and among the improvements to the building are a concrete floor and the installation of an electric lighting system.

Barney Gilinsky, one of the best known business men in Council Bluffs, Ia., is having erected a pressed brick structure, 65 by 115 feet, one story in height, at the corner of Broadway and Eighth streets, which will be used as a garage and automobile supply and service station. It will be managed by his son, Joseph Gilinsky.

Marion Brown has installed new machinery in his garage at Graniteville, N. Y.

The J. H. Hansen Company is to open a new service station at 225 South St. Joseph street, South Bend, Ind. The building has been entirely remodelled and will be used as a show room for the Abbott-Detroit, made by the Abbott Motor Company, 612 Waterloo street, Detroit, and the R-C-H, manufactured by the R-C-H Corporation, Detroit.

Frank E. Block is having an automobile salesroom, 100 by 100 feet, two stories high, erected in Atlanta, Ga. The building will be of mill construction, will have two steam plants for heating and will be lighted by electricity. The cost, it is said, will be $25,000.

John S. Bridges has plans under consideration for the erection of a garage at Charles and 35th streets, Baltimore, Md. The building is to be of two stories and will cost $2500. The contract has been awarded to Gladfelter & Chambers.

The Capitol City Auto Company of Hartford, Conn., found it necessary recently to secure larger quarters, and salesrooms have been opened at Allyn and High streets, affording increased floor space for the storing and demonstration of machines.

The Harvard Garage Company has been formed in Boston with a capital stock of $5000. One hundred shares at $50 each have been issued. The directors are: E. F. Blake, John B. Lynch and W. E. Collins.

Charles Doughman, Ottawa, Kan., has taken the local agency for Lion cars, made by the Lion Motor Car Company, Adrian, Mich., and will conduct a garage and salesrooms in addition to his hardware store.

The Shelton Garage, Ansonia, Conn., is now in the hands of J. N. Sinsabaugh, he having purchased the interest of Frank Alling, who has gone to New Haven to open a garage.

Commercial Motors Company, with headquarters at 432 E. Broadway, Louisville, Ky., was recently organized with the following officers: President and treasurer, Harry B. Fitch; vice president and manager, R. C. Hurt; secretary, R. E. Scharf. The company will conduct an automobile service station, and is incorporated for $10,000.

Winegarten & Holmes has opened a new garage in the Carter block, Jottingham, Ill.

The Big Rapids Automobile Company, Big Rapids, Mich., is installing new machinery, including a drill press and a lathe. This will enable the concern to handle almost every class of automobile repair work.

The Texas Motor Car & Supply Company, Cuero, Tex., has bought the automobile business of Richter & Cook and is to move into the Knights of Pythias building, which is being fitted up especially for use by the company.

The Morgan Garage at I and Tuolumne streets, Fresno, Cal., was recently sold to A. J. Arnaudon of Mendota, for $45,000. It is a two-story brick building a little over a year old, and will be continued under the same management.

The Pan-American Motors Company, recently organized in San Francisco, Cal., to handle Michigan and Moon cars for the northern Pacific Coast, is to build a new structure at a cost of $300,000 at Golden Gate avenue and Hyde street. It is planned to make it one of the most modern and attractive in the city, the plans calling for what is remarkable in a city establishment—namely, a 20-foot lawn in front. The building will be of steel and concrete, thoroughly fireproof.

The Tire & Auto Service Company is the title of a new concern which is located at 1580 Woodward avenue, Detroit, just beyond the Grand boulevard. The company carries tires principally, but also handles a large line of accessories and supplies.

The Donaldsonville Garage Company, Donaldsonville, La., is erecting an addition to its garage to be utilized as the Pioneer Auto Brokers. Second hand cars will be handled, and a repair shop conducted.

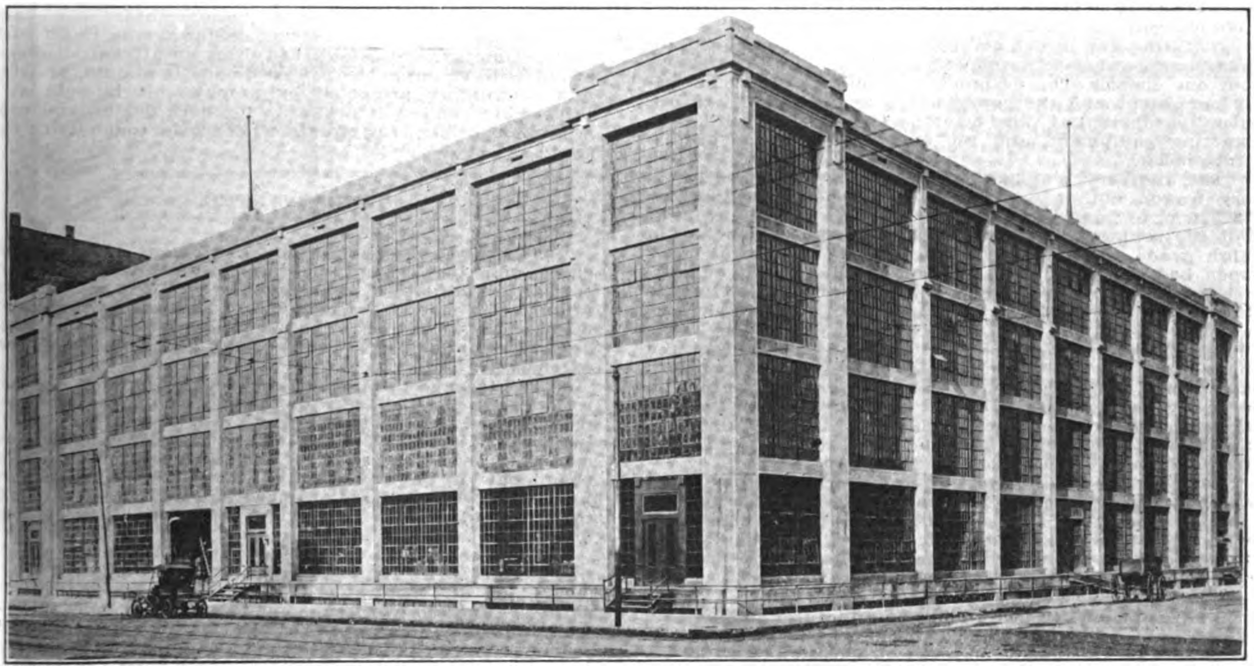
The Florida Apperson Sales Company, Jacksonville, Fla., has moved to 325 West Adams street, taking the quarters formerly occupied by the Miller Automobile Company and securing room for a larger display of cars.

The Hailey Auto Company, Hailey, Id., has been bought by Furcht & Thorp, who will conduct a repair shop and livery business.

The W. P. Barnhart Company, Washington, D. C., has leased the store at 1707 Fourteenth street, N. W., where the Everitt car will be handled after extensive alterations have been made.

Julian Howard, Jacksonville, Fla., has moved from his former location to 532 West Forsyth street.

The W. H. McIntyre Company, Auburn, Ind., has appointed a number of new agents who will handle the McIntyre line of motor trucks in their respective localities. The new agents follow: McIntyre Commercial Car Company, Hartford, Conn.; Mechaley Auto Company, Stamford, Conn; Shinkle, Richardson & Co., Huntington, Ind.; Fox Brothers, La Crosse, Wis.; McIntyre Auto Sales Company, Webster, N. Y.; Imperial Motor Car Company, Nashville, Tenn.; C. E. Swanson, Chicago, Ill.; Syracuse-McIntyre Company, Syracuse, N. Y.; Werick Brothers Motor Car Company, Buffalo, N. Y.; George R. Beeson, Connersville, Ind.; Kingman Plow Company, St. Louis, Mo.; Bradley, Merriam & Smith, Council Bluffs, Ia.; E. Wiley Hill, Butte, Mont,; McKee & Scott, Fresno and Bakersfield, Cal.; McIntyre Auto Sales Company, Albany, N. Y.; Standard Motor Truck Company, Boston, Mass.; D. F. Head, Ithaca, N. Y.; H. H. Maurer, New Berlin, Penn; Lovegrove & Co., Philadelphia, Penn; F. B. Austin, Little Falls, N. Y.; Banta Brothers, Peoria, Ill.; J. J. Aker, Schenectadv, N. Y.; Owen M. Smith, South Whitley, Ind.; F. A. Burmeister, Memphis, Tenn.; Hartford City Auto Company, Hartford City, Ind; J. August Schmidt, Gloversville, N. Y.



Factory of the Dayton Engineering Laboratories Company in Dayton, O., Where the Delco Starting and Lighting Systems Are Made.

The Donaldsonville Garage Company's addition will also include a paint shop, 26 by 38 feet. It will be divided into two rooms, one an air tight and dust proof drying room.

The Dove Machine Company is a new concern in South Lawrence, Mass., occupying a $30,000 brick structure at the corner of Broadway and Groton street. The building is thoroughly equipped with all kinds of machine tools for automobile repair work, including a large power hammer.

The Richardson Tire Company, Hartford, Conn., recently moved into new quarters at 20 Ford street, in order to secure more room to accommodate its rapidly growing business. The firm makes a specialty of tire repairing and carries a full line of supplies.

The Mandel-Frisbee Auto Repair Company, Sioux City, Ia., has just opened a new garage at 312 Pearl street. An automobile livery is being conducted, and the establishment includes a repair shop and painting rooms.

The Maine Motor Car Company, Portland, Me., was recently organized to succeed the Maine Motor Carriage Company. Offices have been taken at 43 South street, where car sales will be handled until Nov. 1, when the garage and accessory department will be turned over to the new company, which has $50,000 capital.

The Five Points Auto Company, Fort Smith, Ark., recently opened for business at 913-15 North A street, with J. R. Braidwood and A. W. Chisholm in charge.

Lusted & King, San Diego, Cal., has leased the establishment at 1140 Second street known as the Modern Automobile Shop, and will continue it under the name of

The Wevco Supply Company, St. Louis, Mo., with branch houses in Birmingham, Ala., and Ft. Worth, Tex., has taken the agency for Hagstrom spark plugs and other products of Hagstrom Bros., Lindsborg, Kan.

The R-C-H Corporation, Detroit, has signed agency contracts with the following: J. H. Reichhardt Company, Cornell, Ill.; Rudolph Dittmar, Masbach, Ill.; the Capitol Motor Car Company, Raleigh, N. C.; Crescent Garage, Riverside, Cal.; Clark's Garage, Pomona, Cal.; Alfred S. Donau, Tuscon, Ariz.; G. F. Wisegarver, Decatur, Ill.; Weir-Moore Motor Company, Monmouth, Ill.; Fred Fiene, Freeborn, Minn.

The King Motor Car Company, Detroit, has appointed new agents as follows: Coleman Cutchins, Richmond, Va.; Barton Ford Motor Company, Cedar Rapids, Ia., and S. J. Wise & Co., Boston, the last named, for New England. The King car is now being manufactured in a new factory which is being run night and day to fill orders.

The Murray O'Neill Company, New Bedford, Mass., is now fully settled in its new garage at 497-501 County street. The building is well protected against fire, the boiler room being separated from the rest of the departments, while the gasoline room is divided from the brazing department by a concrete wall.

TRADE INFORMATION EXCHANGE
BUSINESS PROPOSITIONS.

Two Classes of Opportunities Are Offered Below—for Agents to Secure New Lines, and for Manufacturers to Secure Agents. These Propositions Offer State and Community Representation to Makers of Pleasure Cars, Motor Trucks, Accessories and Supplies, While Dealers May Get in Touch with Manufacturers Desiring to Extend Their Agency Connections. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without the Names of the Firms, Which Desire Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding to the Concerns.

AGENTS WANTED.

772, Trucks—A desirable connection may be made by a number of agents for a line that includes both electric and gasoline delivery wagons and trucks. The machines are built by a concern of undoubted reliability, with large resources, and the guarantee given to purchasers is very broad. The factory attention given by this company is such as to justify careful inquiry. The range of prices is extremely wide, vehicles being produced for every requirement.

798, One-Ton Truck—Agencies can be established for a high grade service wagon of one ton capacity, made with but one chassis. The design is in every way mechanically consistent and the construction and material are unusually substantial The machine is furnished with self-starting equipment, and the opportunity is one of distinct merit.

806, Delivery Wagon—The maker of a standard delivery wagon with a capacity of 1500 pounds, selling for $875 f. o. b. factory, wishes to establish agents throughout the country. The machines are well constructed, of high grade material, have all desirable equipment, with open body standard, and are sold with a broad guarantee. The line is one which will interest all desiring to secure the agency for a popular priced and reliable machine.

779, Delivery Wagon—Agents generally are required by a well established firm making a delivery wagon with a capacity of 3000 pounds. The vehicle is high grade in every respect, and possesses an unusual number of exclusive features which insure economy of time and attention and make for reliability. The price for the chassis ranges from $2200 to $2500 f. o. b. at the factory.

918, Delivery Wagons—Manufacturer of two types of delivery wagon, one of 1000 pounds and the other of 1500 pounds capacity, the first with enclosed and the latter with open body, will make attractive arrangements with live wire representatives. Some excellent New England territory is available. The machines sell for $1000 and $1050 f. o. b. at the factory.

814, Oil and Grease—The manufacturer of a well known and widely advertised line of automobile oils and greases has an agency contract proposition that is exceedingly liberal to offer to those who wish to connect themselves with a reliable and dependable firm. The oils and greases are of grades to meet every requirement and are produced from the highest class crudes by scientific refining.

816, Spark Plugs—A spark plug manufacturer, producing plugs that have exclusive and desirable qualities, wishes to establish a number of first class agencies. A liberal contract is offered and territorial rights will be given to those who can demonstrate their ability to secure business.

801, Plant Opportunity—A company manufacturing high grade pleasure car and motor truck wagon wheels in New York State, having excess factory space and facilities, will consider proposition to combine with a concern manufacturing automobile parts or completed vehicles. The plant is new, equipped with the latest machinery and ample power, has abundant water from artesian wells and good fire protection. The site covers four acres, with an 856-foot frontage on the railroad. The city is a rapidly growing one and possesses the best of freight and express shipping facilities. The company desires to increase its capital and business, and to the proper parties will lay the proposition open to the closest inspection.

891, Pleasure Cars and Trucks—Agencies are open for a line of high grade pleasure cars, trucks, municipal service wagons and fire department apparatus, widely known and well advertised, made by one of the best established manufacturers in the industry. Every class of vehicle required for business or pleasure is produced and the maker is prepared to afford factory service of a character calculated to secure results. The proposition is open only to those who can purchase a demonstrating machine and contract for a number of cars commensurate with the territory taken.

892, Delivery Wagon—An excellent opportunity is offered dealers who desire to handle a small delivery wagon possessing unusual merit. The car has a maximum capacity of 1600 pounds and sells for $750. Manufactured in Newark, N. J., it possesses unusual strength and reliability, coupled with the simplicity which was the keynote in designing the car. An excellent proposition will be made to dealers throughout the country.

893, Gasoline Gauge—The manufacturer of a new gasoline gauge wishes to secure dealer agents in all parts of the country. To established firms an attractive proposition will be submitted. The device is simple, reliable. and thoroughly protected by patents. It is sold at a price which makes it desirable for both dealer and user. A great specialty for agents who are in touch with the trade.

LINES WANTED.

811, Accessories and Garage Equipment—A large machine shop in Vermont, making automobile and garage specialties, desires to secure agency relations with manufacturers of standard accessories, supplies, garage equipment and similar lines. The concern is an old established one, and contemplates entering the automobile business extensively.

929, Pleasure Cars and Trucks—The agency for two well known lines of cars in Omaha, Neb., wishes to expand and secure the representation of pleasure cars selling from $750 to $1250, and trucks from $800. The concern has been successful in handling two of the most prominent of the moderately priced lines of cars, and knows its field well. Consideration will be given only to nationally known cars which offer possibilities commensurate with the field.

833, Pleasure Cars and Accessories—The agency for a line of pleasure cars selling for not more than $2000 is desired by the proprietor of a Vermont garage. The locality offers an excellent opportunity and the man is well known and progressive. He also wishes to handle standard lines of accessories and supplies. The garage is to be improved, and catalogues are desired from manufacturers of garage and repair shop equipment and supplies.

877, Express Data Wanted—A resident of New York. City, desires to obtain from manufacturers of electric wagons and trucks the results obtained with these vehicles in an express business, including information concerning small installations and the approximate cost of operation and maintenance. This prospect is worthy of the attention of every maker of electric vehicles of the type desired.

1004, Wanted, Agency for Gas and Electric Trucks—A resident of Boston, Mass., desires to make an agency connection with a manufacturer of gasoline and electric delivery wagons and trucks. Has unusual opportunities for the sale of electric machines. Has an acquaintanceship with many of the managers and superintendents of electric lighting and power companies throughout New England, who may be in the market for electric conveyances, preferably from 750 to 1500 pounds capacity, that can climb hilly streets at reasonable speed and make from 15 to 20 miles an hour on good roads. With a satisfactory selling arrangement could establish selling agencies with many electric companies.

927, Accessory Lines Wanted—An active and energetic selling agent, with wide acquaintance in the motor vehicle and equipment trade, is about to establish an office in New York City, to represent several well-known and well-advertised lines. He is desirous of learning of specialties produced by manufacturers who want to create and continue strong introductory campaigns and who have the products that will justify this form of endeavor.

912, Wanted, Agency for Pleasure Cars—Man now erecting a high-class garage in a hustling Illinois city is desirous of becoming agent for a line or lines of automobile pleasure cars selling from $1000 to $2000; also a line of automobile equipment, a line of automobile accessories, a line of automobile supplies, garage equipment and supplies, machine tools, and repair shop equipment and supplies. This proposition should interest practically every manufacturer of automobile vehicles and accessories, supplies and garage equipment.

968, Accessories—A new concern, located in Rock Island, Ill., and carrying a line of accessories, desires to increase its business by the addition of new lines. Well advertised articles of merit are wanted, and the company desires to build up a high class trade. Supplies are also desired, such as tires and oils. The company is a new one, but gives every evidence of success, and connection with it will no doubt prove of mutual profit.

946, Accessories, Supplies, Tools—The manufacturer of a line of pleasure and commercial cars, located in Wisconsin, desires to hear from manufacturers of automobile equipment, accessories, supplies and tools of all kinds. The company has been developing its agency for some time, and now plans to expand. Factory equipment and machine tools are also to be purchased.

762, Pleasure Cars, Trucks and Supplies—Boston men desire to hear from manufacturers of pleasure cars, trucks and supplies, catalogues and full details of the agency propositions being wanted. It is contemplated to enter the business extensively, with several lines of cars and the more prominent accessories and supplies.

764, Cars and Accessories—A subscriber to the Exchange, located in Boston, desires to enter the automobile business extensively, and wishes to hear from manufacturers of pleasure and commercial cars and camp wagons, accessories and supplies. Well advertised lines of quality are desired.

987, Wanted, Time Clocks, Stamps and System Details—This proposition covers the inquiries of two subscribers who are desirous of obtaining full information relative to time clocks and systems, suited for, or which may be adapted to the use of garages of moderate size. Both concerns are anxious to purchase and want the best available. With replies please enclose two sets of literature.

1001, Wanted, Agency for Trucks—An established service station in a progressive commercial centre of New England, wishes to make an agency connection with a manufacturer of motor driven trucks selling from $1000 to $1500. This concern handles several lines of pleasure cars and has a well-organized sales department.

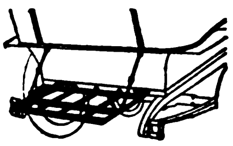
961, Wanted, Equipment—The management of a garage doing a business of considerable proportions is to make a number of changes and wishes to obtain full information and prices concerning air compressors and other modern service station equipment.

760, Wanted, Information Covering Fire Apparatus—Two members of the purchasing board of the fire department of a large New England municipality desire to learn from all manufacturers of all classes of motor driven fire apparatus, prices and full information concerning each type, where such equipment is now in service, the work it is doing, the cost of maintenace, and comparison with other forms of service.

HI-PO WATERPROOF DRY CELLS

Absolutely Reliable—Each cell protected by an insulated waterproof case—
Not affected by moisture—Can be exposed in any weather and in water.
Not made by the Trust, but they cost no more. Your dealer or LINCOLN ELECTRIC CO. 1087 Atlantic Ave., Brooklyn, N.Y

25c. ea.



"STANDARD" TRUNK RACKS

Connecticut Steel and Wire Co., Hartford, Conn.

ABSOLUTE TIRE PROTECTION
GIVEN ONLY BY THE
Hopewell Tire Case

It prevents any water entering the spare tire (either from rain or hose used in washing.) Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

Hopewell Brothers Newton, Mass.

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The ACCESSORY and GARAGE JOURNAL REACHES 11,500 Buyers Monthly,—the Executives of Industries or Enterprises Producing or Selling Motor Vehicles, Equipment, Accessories or Supplies, or Heads of Garages and Public Service Stations.

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The Oil Most talked about today.

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Ask about it.

It suits and does not soot.

In 4 and 6 cylinder water cooled cars.

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NO-KARBON (REGISTERED)

EAGLEINE AUTO CYLINDER OIL

AGENTS

Proposition For Live Dealers

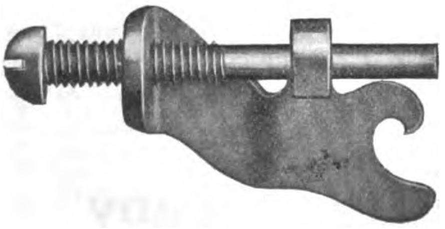
EAGLE OIL & SUPPLY CO.

104 Broad Street, Boston, Mass.

"The Car that made the High Gear Famous"
SPRINGFIELD
Knox
MASSACHUSETTS

Q. D. RIM REMOVER

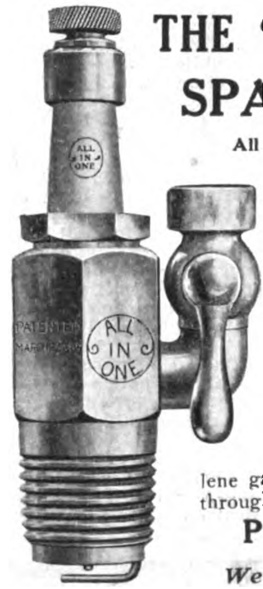
Saves Time, Labor, Trouble



Hook the tool over the outer edge of tire rim, between the two ends of locking ring. Push valve tube into rim so that locking lug clears inside of Shoe. Screw the bead ring off locking ring. It holds the rings apart, leaving both hands free to remove the locking ring. Nickelled and case hardened, it weighs 2 1-2 oz. If not carried by your dealer, mailed prepaid in the U. S. on receipt of 65c P. O. or EXPRESS MONEY ORDER, or 75c on check requiring collection charge.

Dealers and Jobbers, Write for Price List.

WM. L. TOBEY, - - 20 Lewis Street. EAST BOSTON, MASS.



THE "ALL-IN-ONE" SPARK PLUG

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Prime your engine and clean your plugs at the same time.

Price $1.50 Each

THE "ALL-IN-ONE" Starter Plug

First in the Field.

Can be used with any acetylene gas starter where gas is passed through the cylinder.

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We shall prosecute vigorously all infringements now on the market or any which may spring up in the future.

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Get Our Catalog and Discount Sheet

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Can be prevented with our

AUTOLOCK SWITCH

Put on Coil or Dash in ten minutes. Yale key for plug. One operation. Write for descriptive folder and price.

BLACKBURN SPECIALTY CO., 1132 Prospect Ave., Cleveland, O.

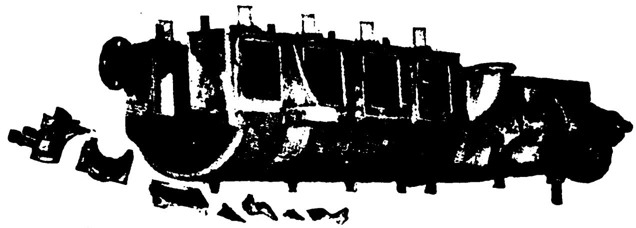
New Departure "TWO-IN-ONE" **Ball Bearings**

The only ball bearing that takes load from any direction with equal efficiency.

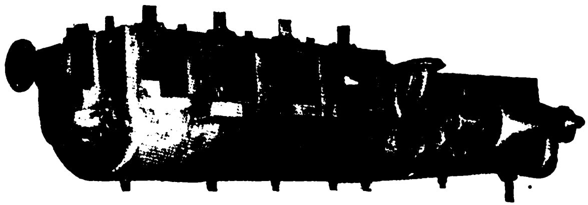
Catalog for the asking

THE NEW DEPARTURE MFG. CO.

Bristol, Connecticut



(1) Aluminum crank and gear case, combined, worth $96, with end bearing and part of end broken out.



(2) Same crank and gear case with end bearing welded with Prest-O-Welder. Complete cost of repair only $7.75.

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WILL PAY BIG PROFITS TO

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The pictures above tell the story. $96 worth of material saved for $7.75.

The profits from this piece of equipment will pay you back its cost and big profits in a short time.

The Prest-O-Welder is always ready for instant use--needs no attention beyond opening two valves when you are ready to use it.

It welds brass, bronze, aluminum, steel and cast iron with a strong, seamless surface.

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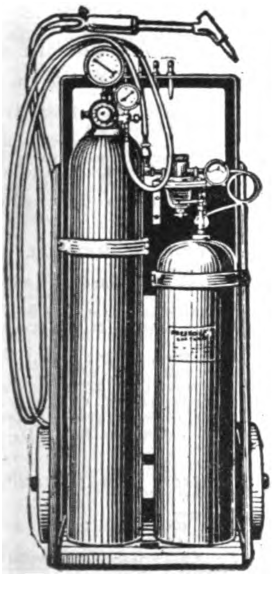
By its use thousands of men are going to build up big paying businesses. Millions of dollars worth of parts are thrown away that can be made as good as new by welding.

Don't let the opportunity go by. Figure the profits that this proposition means. Learn how we help you to build up business with the Prest-O-Welder.



Learn how automobile parts, costing $326.00 to replace, can be welded for $11.78. We stand ready to prove these facts to your satisfaction.

Send today for the Prest-O-Welder literature, giving full information, explaining the operation and construction and showing how the most difficult welding jobs are done.

The Prest-O-Lite Company

Welding Dept., 309 W. South St.

Indianapolis, Indiana

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, Mass.

Branch: 113 Massachusetts Ave., Boston.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.

Branch: 1974 Broadway at 67th St., New York.

Miller, Chas. E., 97-103 Reade St., New York.

Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York, 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., St., Detroit; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 185 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

New Departure Mfg. Co., Bristol, Conn.

BATTERIES.

Geiszler Bros. Storage Battery Co., 514 W. 57th St., New York.

Lincoln Electric Co., 1007 Atlantic Ave., Brooklyn, N. Y. (Hi-Po Waterproof Dry.)

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)

BLOW-OUT PATCHES. (See Patches.)

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind., South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston; 237 Lafayette St., New York.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CARBURETORS.

Sumner, George, Inc., 1841 Broadway, New York; 755 Boylston St., Boston. (Rayfield.)

CARS—GASOLINE PLEASURE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas-Knight.)

Branch: N. E. Corner Broadway and 64th St., New York.

Berkshire Motors Co., Cambridge, Mass. (Berkshire.)

Brush Runabout Co., 3 West 61st St., New York. (Brush runabout, Liberty-Brush.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)

Cole Motor Car Co. See Henderson Motor Sales Co.

Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)

Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Sales Co., Indianapolis. (Cole.)

Eastern Distributors. Colt-Stratton Co., Broadway at 68th St., New York.

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Hupp Motor Car Co., 1268 Milkaukee Ave., East, Detroit. (Hupmobile.)

Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.

Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Buggy Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., Cleveland. (Peerless.)

Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

R-C-H Corporation, 107 Lycaste St., Detroit. (R-C-H.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)

Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)

Branches: See Cars Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.)

Branch: See Cars—Gasoline Pleasure.

Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st St., New York. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Federal Motor Truck Co., 114 Isabella St., Detroit. (Federal.)

General Motors Truck Co., 1302 Jefferson Ave., East, Detroit. (G. M. C.)

Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)

Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis. (Mais.)

Peerless Motor Car Co., Cleveland, (Peerless.)
Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Stewart Motor Corporation, Buffalo, N. Y. (Stewart.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 8 West 61st St., New York. (Sampson, Brush, Stoddard.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., Detroit. (Anderson.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 1802 Jefferson Ave., East, Detroit. (G. M. C.)
Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield Mass. (Atlas.)
Branches: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

BUYERS' GUIDE---Continued

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

United States Motor Co., 3 West 61st St., New York. (Sampson.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE AND ANTI-SKIDDING DEVICES.

Leather Tire Goods Co., Suspension Bridge Sta., Niagara Falls, N. Y. (Woodworth Treads, Kant-Skids.)

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.

Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Prest-O-Lite Company (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Automobile Supply Manufacturing Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston. (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City.
Branches: 1700 Broadway, 212-214 W. 88th St., New York; 825 Columbus Ave., Boston; 1437 Vine St., Philadelphia; 1458 Michigan Ave., Chicago; 289 Halsey St., Newark, N. J.; Ocean and Third Aves., Asbury Park, N. J.; Bretton Woods Garage, Bretton Woods, N. H.; 1524 Grand Ave., Kansas City, Mo.; 801 Woodward Ave., Detroit.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS—HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)

Geiszler Bros. Storage Battery Co., 514-520 W. 57th St., New York.

Gray & Davis, 55 Lansdowne St., Boston.

Remy Electric Co., Anderson, Ind. (Remy.)

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Fiske Bros. Refining Co., New York. (Lubroleine.)
Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Haws, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Bldg., Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia. (Invader.)
Branch: 284 Columbus Ave., Boston.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia; 1436 Michigan Ave., Chicago; 1111 Superior Ave., N. W., Cleveland; 435 Turk St., San Francisco; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Standard Oil Co., New York. (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York.
Branches: Boston Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 605 Brown Bros. Bldg., Philadelphia; 154 Exchange St., Bangor, Me., 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.

Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)

Kimball Manufacturing Co., Motor Mart, Boston. (Mea.)

Marburg Bros., 1777 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., Walton Ave., and 138th St., New York.
Branches: 1679 Broadway, New York; 1110 S. Michigan Ave., Chicago; Motor Mart, Boston; 430-36 Van Ness Ave., San Francisco; 368 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.

MATS.

Sidwell Pedal Mat Co., 245 Columbus Ave., Boston. (Pedal.)

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

Emblem Manufacturing Co., Angola, N. Y. (Emblem.)

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Swenson, B. A., 298 Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Hazard Motor Manufacturing Co., 785 Coates St., Rochester, N. Y. (Hazard.)

Western Motor Co., Marion, Ind. (Rutenber.)

PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

PUBLICATIONS, AUTOMOBILE.

The Automobile Journal, 24 issues, $1.00 the year.

The Motor Truck (Commercial Car.) Monthly, $1.00 the year.

The Accessory and Garage Journal, Monthly, $1.00 the year.

The A B C of Motor Car Operation	$.50
Overhauling, Rebuilding and Equipping the Motor Car	.50
The A B C of Aerial Navigation	.50
The A B C of Internal Combustion Engine Maintenance and Repair	.35
The A B C of Carburetor Construction, Maintenance and Repair	.35
The A B C of Magneto Systems	.35
The A B C of Battery Ignition Systems	.30
The A B C of Motor Car Chassis Maintenance and Repair	.25
Maintenance and Repair of Motor Car Tires	.25
Lighting the Motor Car by Electricity	.25

Sent Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

PUMPS, OIL AND GREASE.

Randall-Faichney Co., Boston. (B-Line.)

PUMPS, TIRE.

Brown Co., The, Syracuse, N. Y. (Brown Impulse.)

Clarke Pump Co., 1489 Washington St., W. Newton, Mass. (Crown.)

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demontachable.)
Branches: New York, Chicago, San Francisco.

RIM REMOVERS.

Wm. L. Tobey, 20 Lewis St., East Boston, Mass. (Q. D.)

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 436 South Dearborn St., Chicago.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston. (Acme.)

Boyd, F. Shirley, 903 Boylston St., Boston.

Hartford Suspension Co., 146 Bay St., Jersey City. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Eliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York; 55 Boylston St., Boston. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago. (Sta-Rite.)

Janney, Steinmetz & Co., Philadelphia.

Kimball Manufacturing Co., Motor Mart. Boston. (Lodge Double-Pole.)

Randall-Faichney Co., Boston. (Mac-Kae.)

Progressive Manufacturing Co., The, Torrington, Conn. (Black Eagle.)

Splitdorf Electrical Co., Walton Ave. and 138th St., New York.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston. (Mac-Kae Universal.)

SPEEDOMETERS.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave.; Detroit 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.: 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston: 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia: 5940 Kirkwood Ave., Pittsburg: 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland.

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

Leather Tire Goods Co., Suspension Bridge Station, Niagara Falls, N. Y. (Woodworth treads, repair boots and emergency stops.)

Page-Lester Co., 129 W. Van Buren St., Chicago. (Tite-Wad Rubber Putty.)

TIRES—CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park Sq., Boston; 1731 Michigan Ave., Chicago; 905 First Ave., South, Minneapolis; 1529 Cleveland Place, Denver; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco; 917 E. Pike St., Seattle; 816 North Broad St., Philadelphia; 1197 Broadway, New York; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit: 1616 Grand Ave., Kansas City.

Diamond Rubber Co., Akron O. (Diamond.)

Empire Tire Co., Trenton, N. J.
Branches: 292 Devonshire St., Boston; 1305 Michigan Ave., Chicago; 842 Woodward Ave., Detroit; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York; 148 Chambers St., New York; 822 North Broad St., Philadelphia.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Shawmut Tire Co., 97 Bedford St., Boston.

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Philadelphia, Chicago, Kansas City, Cleveland.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES--SOLID AND COMMERCIAL.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tires—Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims--Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS. (See Cars, Commercial.)

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Manufacturing Co., 1756 Cranston St., Providence.

TURNTABLES.

Canton Foundry & Machine Co., Canton, O. (Universal.)

Portland Garage, Portland, Me., (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124. Hartford, Conn. (Kant-Break.)

VULCANIZERS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WASHING DEVICES.

Perfect Manufacturing Co., Albany, N. Y.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

THE ACCESSORY —AND— GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., JULY, 1912. No. 3

FIRST ANNOUNCEMENT OF WIRE WHEELS.

Knight-Engined Stoddard-Dayton Will Be Thus Equipped---Schacht to Have Block Motor---Michigan Plans Surprise---White Abandons Yearly Models---Atlas Engine Works Sold---New Factory Buildings---Other Items of Interest.

Decided interest in the matter of wire wheels has been created in America during the past few months, and it is not at all surprising to learn that at least one manufacturer has adopted this equipment for the 1913 season. Reference is had to the Dayton Motor Car Company, Dayton, O., a subsidiary of the United States Motor Company, and maker of the Stoddard-Dayton. It will be remembered that this concern was one of the first in America to utilize the Knight motor, and the wire wheels are to be fitted to the six cylinder Knight model.

The 1913 line consists of the six-cylinder, built as a touring car, limousine and compartment roadster; the 48 horsepower with valve-in-the-head motor, and touring, limousine and compartment roadster bodies; the 38, with block motor and as touring car, compartment roadster, coupe, limousine and landaulet, and the 30 with block motor and as touring car and compartment roadster.

All limousine bodies are designed to seat seven passengers and embrace every feature and appointment that make for comfort and convenience. The roadsters, all of the compartment type, have a large enclosed space for luggage back of the driving seat. The new landaulet and coupe are typical of the Stoddard-Dayton's standard of coachwork, the former being designed as a seven-passenger car and the latter for three.

For the most part, no radical changes have been made. Minor mechanical refinements that have been dictated by service, have been incorporated, and there are numerous details which tend to simplify driving and promote comfort.

TWO SCHACHT MODELS.

New Motor of Monobloc Design and Other Features of Particular Interest.

Two new models, distinctly different in body design but employing the same chassis, comprise the 1913 line of the Schacht Motor Car Company, Cincinnati, O., according to the recent announcement of the company. These will be known as model NS, a five-passenger touring car, and model KL, a roadster. Both will be equipped with fore doors, and will present all the latest refinements, including self-starter, electric lights, demountable rims and one extra rim, etc. Left hand drive with centre control is employed.

The chassis is practically of the same construction throughout as in the 1912 offering. However, the motor is a new design, being of the monobloc type, with three bearing crankshaft. The bore is 4.25 inches and the stroke, 5.5, making it practically a long stoke unit, and the rating is 45-50 horsepower. Other features include the use of the cellular radiator, full floating rear axle and larger brakes.

THE NEW MICHIGAN.

Two Models on One Chassis to Possess Surprising Innovations of Decided Value.

Formal adoption of the specifications for the 1913 Michigan, the product of the Michigan Buggy Company, Kalamazoo, Mich., has been made but the details are carefully guarded, as it is not the intention of the company to make announcement concerning the new car for a few weeks. The specifications are the work of Chief Engineer W. H. Cameron, who recently joined the Michigan forces, having formerly been with the Willys-Overland Company, Toledo, O.

The company authorizes the statement that the car will remain in the medium price class, although several high priced features are to be incorporated in its design. Two models will be produced, utilizing one chassis—a touring car to be known as model R and a roadster designated as model S. President F. B. Law of the company makes the following statement:

"At present we can only say that we have included a long list of features that automobile men have said could never be figured into a medium priced car. Some of these features are now used only on the famous high priced cars of America and Europe. As manufacturers on a large scale for 30 years, the problem of costs is one of long experience with us. We have solved the cost problem so many times when other manufacturers said it could not be done that we are loath to concede impossibilities in the automobile.

"It has been our ambition from the very first to bring more and more of high priced practise into the medium priced car, as represented by the Mighty Michigan. We have added something every year. But our 1913 car eclipses even our own expectations. We have a surprise—really a staggering surprise—in store."

NEW OLDSMOBILE HEAD.

Oliver C. Hutchinson Leaves Marquette Company to Succeed W. J. Mead.

With the announcement that W. J. Mead, vice president and general manager of the Olds Motor Works, Lansing, Mich., had resigned to become president of the reorganized Amplex Motor Car Company, Mishawaka, Ind., came the information that Oliver C. Hutchinson, formerly head of the Marquette Company, Saginaw, Mich., had been promoted to succeed him.

Few men in the industry are better known to the trade throughout the country, but his most signal success has been in connection with the Marquette company, the product of which may be considered as one of the newest of the General Motors Company, having been placed in the market last year. The plans put under way by Mr. Hutchinson have caused this car to become as thoroughly entrenched as many of the older machines. In connection with the promotion of Mr. Hutchinson, comes the statement that interesting announcements concerning the Oldsmobile line for 1913 may be expected in the near future when Mr. Hutchinson becomes thoroughly acquainted with his new duties.

O. C. Hutchinson, General Manager, Olds Motor Works.

FUTURE WHITE POLICY.

The White Company, Cleveland, O., maker of White pleasure and commercial cars, announces that it has given up entirely the idea of bringing out new models at a certain specified time each year. In accordance with this policy, in the future White cars will be known by their model letters, without reference to date, and a model will continue, irrespective of the year, until it is found advisable to change it. At that time the current model designation will be dropped, and a new one will be substituted. Any change in design or construction that is found desirable will be made as soon as it is apparent that such will be a real improvement, instead of waiting to announce it at the end of the season. For these reasons there will be no 1913 announcement of White cars.

ATLAS ENGINE SALE.

Announcement is made that the Atlas Engine Works property in Indianapolis, Ind., will be sold under a superior court order, July 29. It is stated that a corporation in Detroit, which is desirous of establishing a plant in Indianapolis, will be among the bidders. In the event that this company shall be the successful bidder, the tentative terms of purchase are said to have been arranged as follows: The purchaser to assume the mortgage against the property which secures bonds aggregating $1,050,000; to pay $105,000 indebtedness secured by the bond issue of $150,000 and cancel the bonds, and to turn over to the receiver sufficient money to pay all mercantile accounts contracted since the creditors' committee took charge of the plant, as well as the salary rolls and receivership expenses, amounting to about $80,000. The upset price has been fixed at $80,000. The Detroit concern, it is claimed, would manufacture the Diesel and silent Knight engines as heretofore, and also a line of four-cylinder cars, employing from 5000 to 7000 men. There is no intention of removing the present plant now in operation to Detroit.

GRANT COMPANY MOVES.

The Grant Motor Car Company, Cleveland, O., moved into new factory buildings at 152nd street and St. Clair avenue, Collinwood, recently. The main building is 100 by 400 feet and the auxiliary structure is 60 by 160 feet. Both are of reinforced concrete. The new models made by the company will not bear the date of the year manufactured, but will be listed in series. Series No. 2 will be placed on the market Jan. 1, and each succeeding year another series will be added. The output of the company at present is 15 cars a day, but one model being manufactured. A six-cylinder roadster will be placed on the market the first of next year.

EAST JOINS AMPLEX FORCES.

Another announcement of a change in the personnel of the Olds Motor Works organization at Lansing, Mich., is made in that George L. East has resigned as director of advertising to take a similar position under President W. J. Mead of the Amplex Motor Car Company, Mishawaka, Ind., maker of Amplex cars. Mr. East has been with the Oldsmobile people some five years, during which time he has had general supervision of the advertising and publicity. He will be located at the Chicago offices of the Amplex concern.

BRISCOE DENIES REPORT.

President Benjamin Briscoe of the United States Motor Company, New York City, denies the published report respecting the possible removal of the Columbia Motor Car Company from Hartford, Conn., to Dayton, O. Vice President J. W. Wellington, in charge of manufacturing for the parent concern, joins Mr. Briscoe in this denial.

REACHING THE REAL BUYERS.

Value and Cost of Specialized Publicity Contrasted With That of Private Mailing List.

Engaged in manufacturing and distributing products that are directly or indirectly used in the motor vehicle and allied industries, are approximately 3000 concerns or individuals, including manufacturers, selling agents, dealers and the general trade, who sell direct or through their representatives to the American motorists. This total is increased to between 17,000 and 18,000 when one includes the retail dealers in accessories and supplies, attachments and conveniences, and in this classification may be placed the owners and managers of garages and public service stations, repairers and those who deal in or influence the trade of the 600,000 or so motorists.

Whatever the product, it is necessary to establish it in the market, and it cannot become known unless it is given publicity through legitimate promotion or the individual influence of the purchasers. Obviously the former means brings immediate returns, and the latter a continuance and increase of patronage. If an article is worth producing it is worthy of exploitation, and in proportion to the exploiting is the demand, even though well established and widely known, because of competition that is stimulated in every way by the practical man of business.

The manufacturer or distributor may believe that he can by one line of publicity reach both the trade and the consumers. If this policy is followed it is usually the experience that the results are insufficient, and recourse is made to the mail to reach either the selling interests or the purchasers, or perhaps both. It is always found that a campaign of this character, employing high grade printing, first class postage, and the maintenance of an adequate and dependable mailing list, brings the cost of promotion much in excess of the estimated expense or the publicity appropriation.

Conditions compel the specialization of motoring prints. Advertising solicitors depend upon the circulation of their papers to owners to secure patronage. But it is apparent that if any magazine is devoted to the interests of owners it cannot at the same time appeal to the manufacturers, distributors and the trade. No publication aside from the ACCESSORY and GARAGE JOURNAL is issued wholly for manufacturing and trade distribution. As a business man's print it is conducted for his benefit alone, and it is the only medium that can be depended upon to reach him. It cannot be maintained that there is no field for the trade magazine. Every experience proves that these are the best and strongest publications with those to whom they are devoted. They are not only the logical mediums through which to direct publicity to the industrial interests, but they are read with extreme care. It is evident that the advertising that promotes industry and distribution cannot be expected to stimulate general purchasing and consumption. There must be separate and direct appeals to different classes of buyers.

To secure the same attention from the trade and owners alike then all publications must be used, which would mean duplication of circulation, and unless the advertising was intended for the two interests it would not be of a character to satisfactorily attract either. Besides this there is the element of expense, that would be in itself practically prohibitive.

The ACCESSORY and GARAGE JOURNAL has a circulation of more than 12,000 copies each issue. It is placed in the hands of and is read by practically all the men who direct the purchasing of the concerns identified with the motor vehicle and allied industries. The distribution is guaranteed and it reaches the live buyers—the men who create and influence the market. For advertising service in this magazine the cost is exceedingly moderate. No other publication can equal its productiveness, and no other can give so great value for the money.

To emphasize the economy of publicity in this medium, issued regularly each month and reaching the trade and industry, its service may be compared with circularizing with a private mailing list, which is never systematic, never well maintained, and never dependable, unless an extremely high price is incurred. It is never guaranteed.

The cost of one, two, three and four-page circulars, printed in one color, with a fair grade of envelope, with cost of addressing and maintenance of mailing list, and using a penny stamp, for 12,000 copies, would be at a reasonable estimate $204.50, $217, $224.50 and $232 respectively, and were first class postage used the price would be increased $120 in each instance. This does not include the original expense for a mailing list nor the actual increase through the loss of undelivered packages.

The cost of a page monthly in the ACCESSORY and GARAGE JOURNAL is $50 an issue under a yearly contract, and this space may be increased at the same ratio as desired at yearly rates. A single page costs but $60 an issue. Several pages can be used each issue and yet be well within the cost of a mailing list, without the care of supervision. Practically all lists used by the manufacturers are of the trade.

The cost of maintaining a mailing list is heavy provided it is kept to its maximum efficiency. With the average business man it is an incidental detail. The ACCESSORY and GARAGE JOURNAL subscription list is revised from day to day, because it is absolutely the most important factor in creating the value of the publication. To neglect it means a sacrifice. The distribution of the ACCESSORY and GARAGE JOURNAL is guaranteed, and its use for publicity is as advantageous to the small concern as it is to the mammoth establishment. It is the only magazine in which the same service is given and in which all can be certain of reaching the buyers.

NEW $65,000,000 CONCERN.

W. C. Durant, active head of the Little Motor Car Company of Flint, Mich., and of the Chevrolet Motor Car Company, Detroit, is said to be the principal moving spirit in the Republic Motor Company, recently formed in New York City with a capital stock of $65,000,000. It is claimed that the new concern is to build large factories in 10 of the leading cities of the country, which will serve as assembling plants for the Little and Chevrolet companies.

Quarters for the first plant in the long string were recently secured in New York, when the factory formerly occupied by Rothschild & Co., automobile body builder, which occupies the entire block front on 11th avenue, between 56th and 57th streets, was secured. R. L. Losey, who recently resigned his position as manager of the Indianapolis branch of the Buick Motor Company, is now in New York where he has a position as sales manager for the new Republic company.

THE ACCESSORY -AND- GARAGE JOURNAL
Devoted Exclusively to the Automobile Trade and Allied Interests

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WILLIAM W. SCOTT. CARL A. FRENCH.
C. P. SHATTUCK.

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CONTRIBUTIONS:
Anonymous communications not considered. Correspondence on subjects relating to the motor industry and the trade will receive attention. Stamps must be enclosed to insure return of unsolicited contributions.

ADVERTISING:
Information supplied at request.
Advertising Copy for the ACCESSORY and GARAGE JOURNAL requiring submission of proof must be received by 5th of month to insure publication in issue of the 15th of month.
Advertising Copy, proof not required, accepted to morning of the day before publishing day (unless such day is Sunday or holiday, when previous day is limit) of each publication.
Entered as second class matter Dec. 30, 1911, at the post-office at Pawtucket, R. I., under the Act of March 3, 1879.

NEW CONTEST RULES.

There is much reason to believe that the contest board of the American Automobile Association, as well as the sub-committee of the Manufacturers' Contest Association, has given much time and study to the matter of motor car races, as evidenced by the new rules recently made public. It is decidedly apparent that every effort has been made to guard against the possibility of accident, either to the contestants or the spectators.

It should not be forgotten, however, that the public has some responsibility in this matter. The rules appear to be all that could be asked, and it is to be expected that the referees will see that they are rigidly enforced. Much depends upon the co-operation received from those who attend the events.

THE SPECIALIZED PUBLICATION.

All will agree that the publication devoted to a special class ought to have decided interest for that class, and perhaps incidentally attract some attention from others generally, but just in the ratio that it will possess especial attractions for those whom it concerns it will lack in attraction for other classes. It may be the purpose of the publishers to specialize for that class which appears to be most productive from a publishing standpoint, but it is not practical to divert endeavors to more than one channel and sacrifice the value of the print to the advertisers who are giving, or might be expected to give, it support. It is safe to judge any publication by the consistency of its policy. If there be indifferent or casual attention to the demands of its readers it may be assumed that their interest can be measured by the character and quality of the contents. The best of articles and the finest illustrations will fail in their purpose unless they serve a distinct purpose in the minds of those who are constant readers, because casual interest is absolutely worthless to the publisher.

The AUTOMOBILE JOURNAL was established as a magazine having contents that would interest the owners of pleasure automobile vehicles. It was created with the purpose of publishing articles that were of constant or timely value and of subjects that would be regarded and recognized as promotive of the use of motor cars. In this work of promotion it was realized that it would have the encouragement and support of the industry, at least that element of it that understood that following enthusiasm in pleasure would come the practical views of those who measured expense for motor service, just as they applied a measure to any other need, for every one could forecast the time when the motor vehicle would become a general utility.

It was realized that the owners of cars constitute the market. They are not only the logical buyers of vehicles, but their influence is exceedingly potent with their associates. These enthusiasts are logically the prospective users of cars and it is intensely practical to seek to interest them in what the market affords and to educate them in the relative merits of differing productions. To reach them, however, it is necessary to interest those to whom they naturally turn for advice.

Since its publication the AUTOMOBILE JOURNAL has been an owners' magazine. More than 90 per cent. of its readers are of that class. Its editorial policy has always been to afford its subscribers what was distinctly for their benefit as motorists, and to advocate and encourage whatever would promote their welfare. It has dealt with subjects that were of unusual value and have received recognition because of their decided merit. It has always maintained the editorial standard and it has never restricted the volume of its contents. The best criterion is the constantly growing distribution and advertising patronage, which are an extremely certain gauge of approval.

The specialized motoring magazine has its distinct place, and that place is in the hands of appreciative readers, who know what they want and when the choice is to be made unhesitatingly determine what will best serve their purpose.

ESTABLISHING A TRUCK SERVICE STATION.

Outlining Methods by Which the Average Garageman May Build Up a Successful Business in Caring for Commercial Vehicles.

WHILE it is admitted that in most cities, at least outside the larger centres, the use of the commercial automobile hardly has become sufficiently general to warrant the establishment of garages devoted exclusively to the care and maintenance of motor trucks, the time is not far distant when service stations of this character will be an absolute necessity. The far seeing business man, who desires to keep abreast of the situation, will recognize the truth of this assertion and begin to make provision for taking part in the development of a paying proposition.

—CONTRACT WITH OWNER—

The Eastern Garage & Service Company, in consideration of .... dollars, hereby agrees to provide a weekly inspection, and to keep in perfect running order for one year from date, exclusive of the expense of new parts, the .... ton .... truck, kept at the garage of said service company, and owned by and operated under the direction of ....

Date ....

Signed,

..........................For the Owner

..........................Garage Representative

Suggested Contract Covering Full Service, Six Inches Long by Three Wide.

Those who have given the matter even casual study will agree that the manufacture and sale of industrial transports must be along altogether different lines than those which have marked the growth of the pleasure vehicle side. Indeed, it is now generally acknowledged that the conditions to be met in the satisfactory placing of commercial vehicles are being more or less reflected in the handling of automobiles devoted more largely to pleasure purposes. It is only within a few years that the service station, as it is now known, has come into vogue.

—CONTRACT WITH OWNER—

The Eastern Garage & Service Company, in consideration of .... dollars, hereby agrees to provide a weekly inspection, and to keep in perfect running order for one year from date, exclusive of the expense for new parts, the .... ton .... truck, owned and operated by ...., and kept at the latter's garage, said truck to be delivered at garage of Eastern Garage & Service Company for the inspection and necessary repairs.

Date ....

Signed.

..........................For the Owner

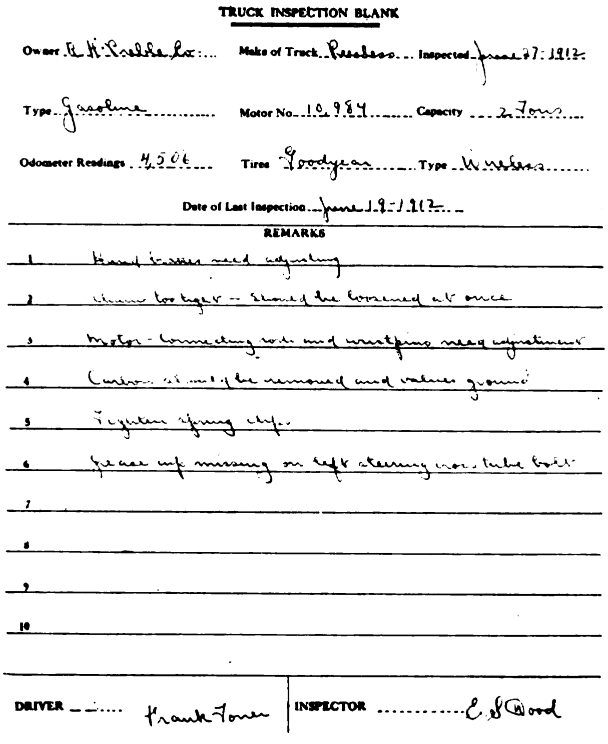
..........................Garage Representative

Suggested Contract Covering Weekly Inspection, Six Inches Long by Three Wide.

Many manufacturers are establishing factory branches in the principal centres, forcing their representatives in the intervening districts to adopt measures more in keeping with the service granted by these branches. In many instances this has meant the investment of larger sums on the part of dealers, but the return in added business has been such as to amply repay for the effort and attention.

If it is possible to increase materially the business done in the sale of pleasure cars through the establishment of service stations which guarantee to the owner that his machine shall be kept in satisfactory condition at a minimum of cost, it follows that the garageman who recognizes the full value of such an investment will be in a position to meet the demands for commercial motor vehicle service when the situation in his immediate locality reaches the point where someone must supply those needs.

The question of investment must be left to individual judgment, but it may be pointed out that it is possible to anticipate the need along this line. The garage proprietor who is firmly established in his community can easily work up a business of this character without feeling the added expense. The returns ought to be sufficient to more than offset the outlay, from the very beginning.



TRUCK INSPECTION BLANK

Owner R. K. Preble Co. Make of Truck Peerless Inspected June 27: 1912

Type Gasoline Motor No. 10,984 Capacity 2 Tons

Odometer Readings 4,506 Tires Goodyear Type Wireless

Date of Last Inspection June 19: 1912

REMARKS

1 Hand brakes need adjusting

2 Chains too tight — should be loosened at once

3 Motor — connecting rods and wristpins need adjustment

4 Carbon should be removed and valves ground

5 Tighten spring clips.

6 Grease cup missing on left steering cross tube bolt

7

8

9

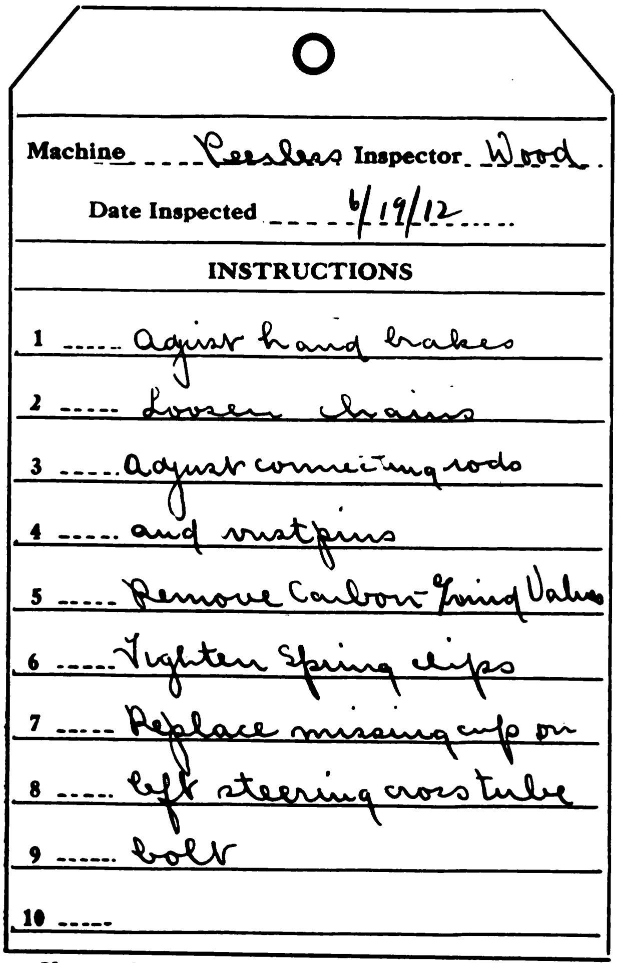
10

DRIVER Frank Jones | INSPECTOR E. S. Wood

Inspector's Report Blank, Eight by 10 Inches.

To cite a concrete instance, it may be stated that about two years ago a garage proprietor in southeastern Massachusetts adopted the policy of caring for his pleasure car owners so long as they were possessed of one of the machines represented by him. Not only does he maintain a system of periodical inspections, thus keeping the car in good order all of the time, but he undertakes to give it a complete overhaul at the end of each year, the charge for this service being $100. His sales have increased materially since this plan was put into operation.

With a business thus established it will prove sur-



Machine Peerless Inspector Wood

Date Inspected 6/19/12

INSTRUCTIONS

1 adjust hand brakes
2 loosen chains
3 adjust connecting rods
4 and wrist pins
5 Remove Carbon-Grind Valves
6 Tighten Spring clips
7 Replace missing cup on
8 left steering cross tube
9 bolt
10

Obverse Side Repair Ticket, Four by Seven Inches.

prisingly easy to so extend the service that it may include commercial motor wagons. It will be admitted that some sort of system is necessary, and as is true of every other feature of the garage business, this system should be as simple as practical results will permit.

For the purpose of further explaining the proposition contained herein it will be assumed that the Eastern Garage & Service Company has been established for some time, with a growing business in the sale of pleasure cars and an agency for some well known motor truck. It follows that it has a thoroughly equipped repair department, a well lighted shop and abundant facilities for undertaking all manner of automobile work.

The location is in a city of moderate size, in which the business men are beginning to appreciate the worth of the motor truck. The Eastern Garage & Service Company believes that the future presents excellent possibilities and that the local business men need the right kind of encouragement at this critical period. Incidentally, it may be remarked that this concern does not feel that the particular make of industrial transport represented by it occupies a position so unique that the product of no other manufacturer shall be considered.

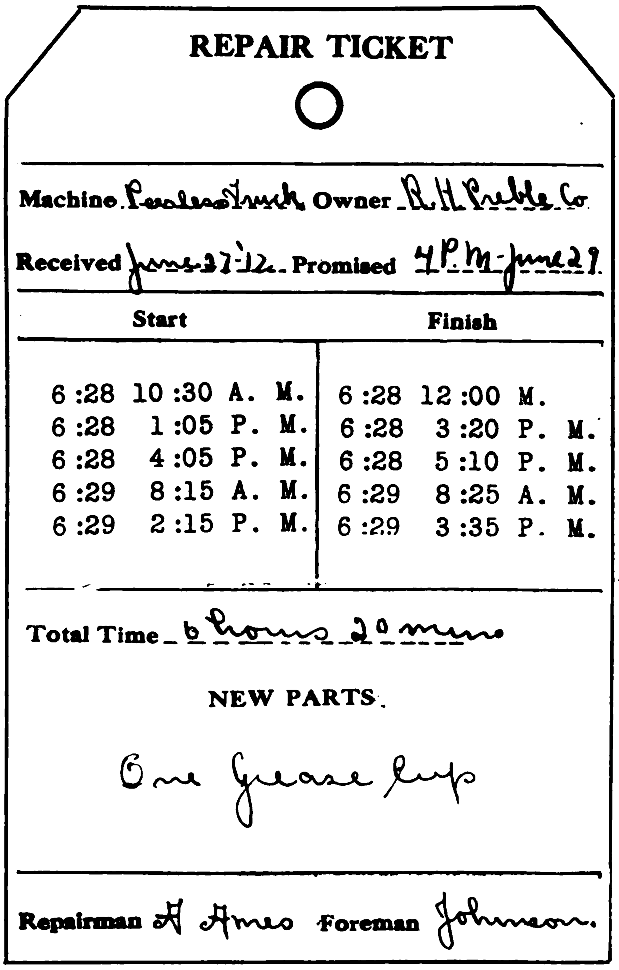
As has been outlined, the concern has the necessary equipment and the opening is one which it is able to meet in a satisfactory manner. Naturally, it offers its customers garage service in its building, where the trucks sold by it may be cared for by men thoroughly acquainted with these vehicles. Perhaps it ought to be suggested that these quarters are too limited to admit of taking all the cars which might be brought to it, and as the business has not yet been developed it will be unwise to add further to the investment at this time. Moreover, there are certain business men who prefer to garage their own trucks, and for these the Eastern Garage & Service Company offers a specified service which should prove attractive.

The two contracts accompanying this discussion set forth in simple language the two types of service. In either case, the truck, no matter what the make, receives periodical and expert inspection. The character of this must be such as to keep the car in perfect working condition. A suggested inspection report is presented, and it may be added that the original is filed in the office of the service station, while a copy is forwarded to the owner of the vehicle.

The contract specifies what repairs shall be assumed by the company. It is bound to make such adjustments at once, but if the report indicates that work not covered by the contract is required, the owner is apprised of this, and can use his own judgment in the matter. It hardly will be expected that such repairs will be delayed longer than absolutely necessary.

Of course, efficiency plays an important part in the practicability of the commercial vehicle, and the owner desires to know just how long his machine is to be kept out of service. This is a point upon which the motor truck service station must be even more particular than is true where pleasure vehicles alone are considered. If possible, a time should be set at which the owner may expect to receive his car, and every effort should be to make delivery as promised.

Having assumed that the inspector has discovered necessary work and that the owner has ordered this done, the office force makes out the accompanying



REPAIR TICKET

Machine Peerless Truck Owner R.H. Preble Co.

Received June 27-'12 Promised 4 P.M.-June 29

Start	Finish
6 :28 10 :30 A. M.	6 :28 12 :00 M.
6 :28 1 :05 P. M.	6 :28 3 :20 P. M.
6 :28 4 :05 P. M.	6 :28 5 :10 P. M.
6 :29 8 :15 A. M.	6 :29 8 :25 A. M.
6 :29 2 :15 P. M.	6 :29 3 :35 P. M.

Total Time 6 hours 20 min.

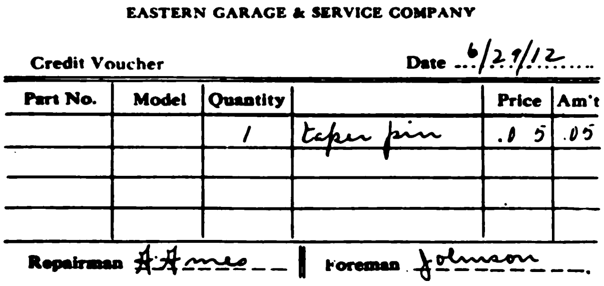
NEW PARTS.

One Grease Cup

Repairman A Ames Foreman Johnson.

Reverse Side Repair Ticket for Checking Time.

repair ticket, which is attached to car on the floor. The repairman is thus informed as to what is required, and no time is lost in going over the machine. All this makes for efficiency, and guarantees to the owner that his vehicle will not be out of service unnecessarily.



EASTERN GARAGE & SERVICE COMPANY

Credit Voucher Date 6/29/12

Part No.	Model	Quantity		Price	Am't
		1	taper pin	.05	.05

Repairman A. Ames ‖ Foreman Johnson

Stock Requisition, Four Inches Long by Two Wide.

Of course, it might be possible that certain repairs would escape detection even by the expert inspector, and such will develop only after the car is dismantled in the shop. Whenever such work is found the owner should be notified at once. This holds true of all repair work, but more particularly with the business man who is depending upon his motor truck. It is not to be assumed that the owner will desire to avoid making necessary repairs, but he must be considered, especially when his business is at stake. He is best able to judge whether it is practical to have the work done at this or some other time.

The obverse side of the repair ticket shows what work is to be done. The reverse has space for noting the amount of time expended upon the vehicle. This is a feature which deserves careful attention. Every garageman knows from experience how difficult it is to convince an owner that the amount of time for which he has been charged actually has been expended on his car. To overcome this difficulty, some scheme must be devised whereby the garage proprietor can show absolutely just how the time of all of his workmen has been employed. It will be admitted that the time clock solves this problem.

The repair ticket should be so constructed, of moderately heavy material, that when the repairman begins work on a given truck he can slip the ticket into the time clock, thereby recording the hour and minute at which he began operations. Whenever he is called away, no matter for what purpose, he should first visit the time clock with his repair ticket, as a result of which when the work is finished he will have a complete record of the job, to which the owner may have access whenever he wishes. Not only will this method tend to eliminate all possibility of dispute, but it will afford the office ample opportunity to check up the daily time of the workmen, thereby simplifying the work of the bookkeeping department.

This is a part of the system, which should be applied to the entire work of the garage or service station. It is quite as essential to convince the owner of a pleasure car that he has not been overcharged in this respect. And it may be added that the last set of blanks presented herewith also is adaptable to any line of repair work.

As the business of the concern grows it will become more and more evident that some system of checking up the supplies must be adopted. Under ordinary circumstances it will be found quite sufficient to make the foreman responsible for the stock room. All goods should be kept under lock and key, and when a workman requires any spare part, for instance, a simple form of requisition should be filled out. Provision also must be made for returning goods which are later found not to have been needed. A credit voucher, like that shown, solves this problem.

It may be said in passing that the system outlined for the Eastern Garage & Service Company is adapted from one which has been employed by a factory branch in one of the larger cities for the past two or three years. It has the advantage of being exceedingly simple, yet entirely sufficient for all needs. By its use the garage proprietor is able at any time to gain information concerning every detail of the business.

The weekly inspection reports keep him in close touch with the owners; the repair tickets show just what work was done, how long it took and how his workmen's time was employed; the requisitions, properly checked up at stated intervals, indicate the condition of the stock room at all times. Not only is this a satisfactory method of keeping watch of the business, but the work of the office force is greatly simplified.

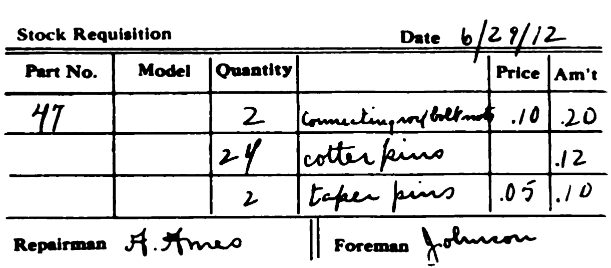
While an attempt has been made to indicate how an established service station may take the initial steps to secure added business, which later will supply a substantial portion of its income, practically all of the system will be found applicable to the average garage and repair shop. The need for some such suitable check on the various departments is being realized more and more, and the suggestions offered herein will be found of distinct value in working out a plan to meet individual needs.

CURRENT PAIGE-DETROITER.

The current issue of the Paige-Detroiter, published by the Paige-Detroit Motor Car Company, Detroit, is replete with information which is timely and of interest to owners and contemplated owners of Paige-Detroit cars, made by this concern. The cover design is quite in keeping with the season, and the text matter is equally pertinent. Three articles are worthy of special mention, these being: "Glad Hand," a story by Clarence E. Goodard and Lewis A. Deffner, both of Springfield, Mass., concerning the first leg of their transcontinental trip from Boston to San Francisco; "The Advantages of Co-Operative Advertising," by James M. Dunlap, and "Coming with Culley," by O. R. Hardwell, advertising manager of the company.

NEW FORD PLANT.

The Ford Motor Company, of Detroit, is still further extending its system of branch assembling plants, and has made plans to establish a station in Milwaukee, Wis. The Courteen block in that city has been leased and shortly will be occupied by the Ford people. Parts will be shipped to Milwaukee by water.



EASTERN GARAGE & SERVICE COMPANY

Stock Requisition Date 6/29/12

Part No.	Model	Quantity		Price	Am't
47		2	Connecting rod bolt nuts	.10	.20
		24	cotter pins		.12
		2	taper pins	.05	.10

Repairman A. Ames ‖ Foreman Johnson

Credit Voucher, Four Inches Long by Two Wide.

UP-TO-DATE Machine & Tool Equipment

OLMSTEAD POWER HACKSAW.

Any tool or device which will save time and labor in the repair shop is money well invested. In well appointed shops the hand hacksaw is employed only for fine work such as the cutting off of pins of small diameter, etc. Where heavy material is to be cut, considerable time is required with the hand tool and often some of the metal is wasted, to say nothing of numerous broken blades in the operation.

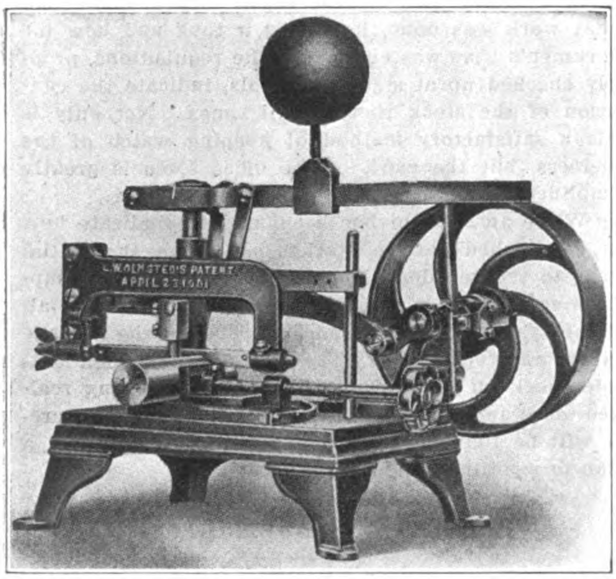


Fig. 1—Olmstead Power Hacksaw Designed for Work up to Two Inches, Either Round or Square.

Power hacksaws are inexpensive and once the work is secured and energy applied, the device requires no further attention until the saw completes its work. During this time the workman can perform other tasks, and an advantage of the power device is that it cuts evenly and accurately.

L. H. Olmstead, Hasbrouck Heights, N. J., manufactures a variety of power hacksaws, these being adapted for light and heavy work. That depicted at Fig. 1 will take work up to 1.25 inches, either round or square, and it may be secured to the bench or table and driven from the main shaft of the power equipment. It is provided with a clutch for starting and stopping and is fitted with a swivel device to permit sawing at any angle. The driving pulley is six inches in diameter and should be driven at 175 revolutions a minute. The net weight of the machine is 16 pounds.

AUTO ENGINE CLEANER.

In the overhaul of the motor car considerable time, as well as gasoline is utilized in removing the accumulations of grease and dirt that collect upon the various components. It is troublesome to remove all grease as many places are difficult of access with the ordinary brush.

The up-to-date repair shop employs air mixed with gasoline which is compressed to a high pressure, and when employed in this form removes dirt easily and quickly. The Cleveland Faucet Company, Cleveland, O., is marketing the Auto Engine Cleaner, shown at Fig. 4, which is designed for the repair shop, garage and private owner.

The complete outfit consists of a three-gallon, seamless, galvanized steel tank, to which a special hand pump is attached, also a gauge and a safety valve. Provision is made for the introduction of gasoline, kerosene or any other cleansing fluid. An air inlet cock is provided, also 10 feet of flexible tubing.

In practise, the tank is filled two-thirds full with gasoline and the outlet cock closed, after which the pressure is pumped up to 80 or 100 pounds. The air inlet cock is next closed, after which the other two members are opened and the apparatus is ready for service. The spraying nozzle is of sufficient length to reach easily any part of the motor or other components of the automobile.

HISEY ELECTRIC BREAST DRILL.

Portable electric hand or breast drills are a valuable addition to the shop equipment as by them work may be drilled either in the vise or on the car. At Fig. 2 is presented one of several types manufactured by the Hisey-Wolf Machine Company, Cincinnati, O. It is made in three types and the motor is operated by a direct current of 110 or 220 volts. It is equipped with two side handles, one detachable and one combination end, and a breast handle. Their speed under load varies according to the design, being from 400 to 900 revolutions a minute. The chuck is offset, allowing drilling in close corners.

The motor is completely enclosed, air-cooled, the openings being in the housing and protected by a brass screening, thereby preventing any cuttings from getting into the motor, no matter in which position the drill is operated. The gears are cut from solid steel, hardened, run in grease, and are separately encased. The brush holders and wire connections are also enclosed, preventing short circuiting. The drill and armature spindles are provided with ball thrust bearings, insuring easy running.

The operation of the drill is controlled by a patented, enclosed automatic switch which controls current by means of a brass trigger operated through the permanent handle. It is claimed that this construction prevents the operator burning his fingers or short circuiting the motor, and that the drill is under control at all times. The handles are made of hollow steel tubing, screwed into the housing. Each attachment

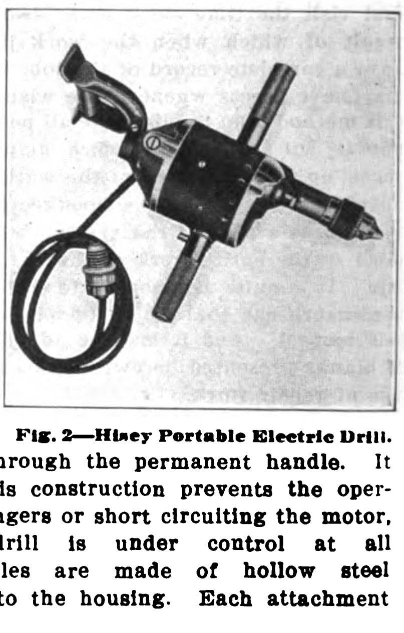


Fig. 2—Hisey Portable Electric Drill.

plug has a fusible cap, protecting the motor from an overload. The drop cord is connected on the outside of the motor housing with an insulated cover, preventing any possible damage by lead wires and inside connections should it be accidentally torn loose.

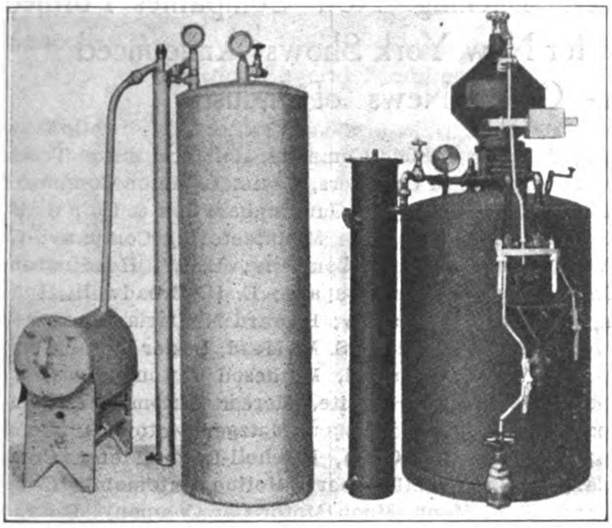


Fig. 3—Oxy-Acetylene Welding and Cutting Outfit Produced by the Oxy-Carbi Company.

OXI-CARBI WELDING OUTFIT.

Oxy-acetylene welding outfits are important factors in the repair of automobiles, as the process permits the welding of broken and cracked parts which were formerly discarded. Although there are concerns which make a special business of welding, some repair shops are installing the apparatus, saving much time as well as deriving profit.

The Oxi-Carbi Company, New Haven, Conn., manufactures both portable and stationary welding outfits and these are designed for any number of blowpipes. The equipment outlined at Fig. 3 is known as the No. 2 and this with the No. 4 is more generally installed by the company.

The acetylene generators are of the carbide feed type and are said to be so designed as to make it impossible for those not familiar with their use to tamper with them and bring about accidents. In charging, the elevating screw shown on the bracket on the front of the hopper is raised to its highest point. This movement raises the feed lever and closes the valve that feeds the carbide. The upper section of the tank forms the expansion chamber and the lower the generating compartment.

Raising the two right hand cock levers shuts off the expansion chamber. Raising the right hand lever gives vent to the generating chamber, and the water filling cock can then be opened, as well as the sludge valve. Turning the agitator handle at the right of the tank loosens the sludge or lime that has settled in the tank. The top of the tank is provided with a removable plug for replenishing the supply of carbide.

When the tank is filled with water to the overflow in the filling funnel, the cock is closed first, then the vent cock and last the gas cocks. The interference rods prevent operating differently, and as the vent pipe connects with the safety pipe which is run to the open air no gas will enter the room with this generator. The object of the expansion chamber is to reduce the air space when recharging, as with this shut off the only air admitted to the generator is in the generating chamber as the sludge is emptied. This air is exhausted as it is recharged, leaving but a small amount, and it is claimed by the maker that this arrangement prevents dangerous mixtures.

With all cocks closed, the elevator screw may be lowered, which allows the valve to open and the carbide to feed through. As soon as pressure of gas is sufficient the lever will raise and close the valve. Utilization of the gas causes the valve to operate and no further attention is needed until the supply of carbide becomes exhausted.

The outfit illustrated has 25 pounds capacity. The oxygen generators are of the pressure type and are operated by filling a tray with potassium chlorate mixed with manganese dioxide, and placing in the retort. The cover is then bolted on and the gas burners beneath are lighted. The heat causes the chemicals to give off a gas in the form of oxygen, this passing through purifiers into a storage tank at pressures suitable for welding and cutting. The tank requires from two to 20 pounds according to the size of tip employed, while for cutting, 30 to 75 pounds is utilized. It is stated that one tray full will produce approximately 28 cubic feet. The retorts may be recharged immediately if required.

The blowpipes utilized with the outfit are of the improved type and capable of performing a wide range of work, the No. 1 equipment having five tips, these being for sheet metal up to .25 inch thick and cast iron up to two inches. The welding tip may be removed easily and the cutting member substituted. The latter increases the pressure on the oxygen at the reducing valve and it is claimed that it will cut a two-inch round bar of steel in 90 seconds. In welding, all of the usual metals may be united, such as steel, aluminum and bronze of the different alloys; cast iron, malleable iron, wrought iron, etc.

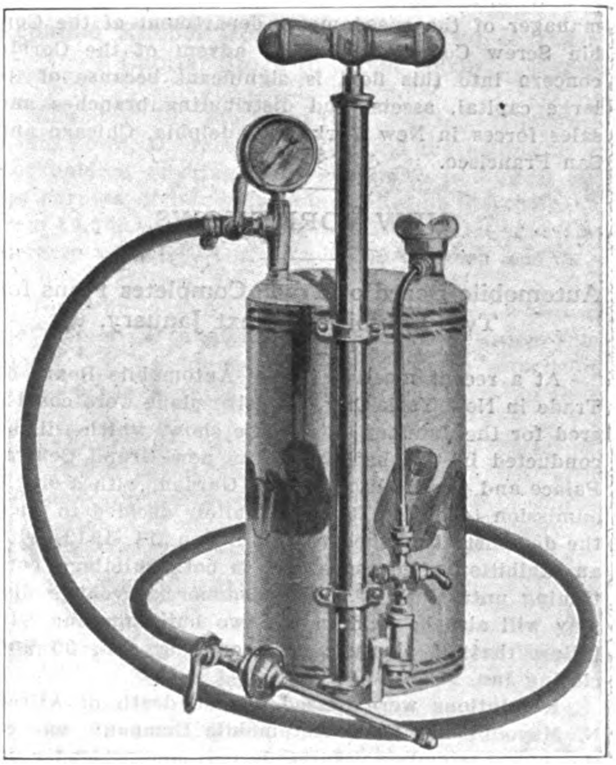


Fig. 4—Auto Engine Cleaner Which Utilizes Gasoline or Kerosene Mixed by Compression.

MANY CONCERNS INCREASE CAPITAL.

Maker of Austin to Secure Additional Financial Backing---New Companies Formed to Produce Cars and Accessories---Plans for New York Shows Announced ---Some Recent Patent Litigation---Other News of Industry.

Plans are under way for a reorganization of the Austin Automobile Company, Grand Rapids, Mich. For the past 10 years, James E. and Walter S. Austin, father and son, have conducted the business and have manufactured in limited quantities one of the most imposing cars that have come out of the West.

George H. Davidson and William R. Shelby of Grand Rapids have become interested with the Austins, and a $500,000 corporation will be organized. Of the capital, $300,000 will be represented by common stock and $200,000 by six per cent. preferred. It is planned to make the Austin product a greater factor in the automobile field than heretofore.

CORBIN IN NEW FIELD.

New Britain Concern Announces Its Entrance into Manufacture of Speedometers.

Announcement has been made by the Corbin Screw Corporation, a division of the American Hardware Company, New Britain, Conn., that it will manufacture and place on the market the Corbin-Brown speedometèr. The device has been known as the Brown speedometer, but under the new name will embody a number of invaluable features.

The Corbin-Brown instrument is the invention of Col. W. C. Brown of New York City, who will be sales manager of the speedometer department of the Corbin Screw Corporation. The advent of the Corbin concern into this field is significant because of its large capital, assets, and distributing branches and sales forces in New York, Philadelphia, Chicago and San Francisco.

NEW YORK SHOWS.

Automobile Board of Trade Completes Plans for Two Exhibitions Next January.

At a recent meeting of the Automobile Board of Trade in New York City extensive plans were considered for the January automobile show, which will be conducted in two buildings—the new Grand Central Palace and the Madison Square Garden, with a single admission to both. It was definitely decided to open the demonstration the evening of Jan. 11, 1913, with an exhibition of pleasure cars in both buildings, continuing until Jan. 18. The commercial vehicle display will also be held in the two buildings and will follow that of pleasure cars, opening Jan. 20 and closing Jan. 25.

Resolutions were passed on the death of Alfred N. Mayo of the Knox Automobile Company, one of the oldest members of the board, and a leader in the automobile industry since its inception.

Those present were: M. L. Downs, Autocar Company; W. C. Leland, Buick Motor Company, Cadillac Motor Car Company, Cartercar Company, Elmore Manufacturing Company, Marquette Company, Oakland Motor Car Company, Olds Motor Works, Rapid Motor Vehicle Company, Reliance Motor Truck Company; Hugh Chalmers, Chalmers Motor Company; James C. Dryer, James Cunningham Son & Co.; G. H. Stilwell, H. H. Franklin Manufacturing Company; G. W. Bennett, Garford Company; E. W. Headington, Haynes Automobile Company; E. H. Broadwell, Hudson Motor Car Company; Howard M. Davis, Knox Automobile Company; W. S. M. Mead, Lozier Motor Company; W. C. Shepherd, Matheson Automobile Company; William T. White, Mercer Automobile Company; William E. Metzger, Metzger Motor Car Company; James M. Cram, Mitchell-Lewis Motor Company; W. H. VanDervoort, Moline Automobile Company; E. J. Moon, Moon Motor Car Company; George M. Dickson, National Motor Vehicle Company; C. C. Hanch, Nordyke & Marmon Company and Premier Motor Manufacturing Company; M. J. Budlong, Packard Motor Car Company; L. H. Kittredge, Peerless Motor Car Company; Charles Clifton, Pierce-Arrow Motor Car Company; George Pope, Pope Manufacturing Company; Oscar Stevenson, Pullman Motor Car Company; F. B. Stearns, F. B. Stearns Company; J. E. Quimby, E. R. Thomas Motor Car Company; Windsor T. White, the White Company; Alfred Reeves, United States Motor Company; John N. Willys, Willys-Overland Company; C. W. Churchill, Winton Motor Carriage Company; H. A. Bonnell, general manager.

PREST-O-LITE PATENT.

Illinois Judge Makes Important Ruling Affecting Product of This Concern.

Justice Kohlsaat of the United States district court for the northern district of Illinois, has decided that the patent of the Prest-O-Lite Company of Indianapolis, Ind., is dead, despite the fact that seven United States district courts and one United States circuit court of appeals have decided that it is still entitled to a lease of existence for some five years. His decision was rendered in the action brought by the Prest-O-Lite people against the Searchlight Gas Company of Chicago, sustains his denial of a preliminary injunction, and until the case is fought out in the court of appeals, gives the Searchlight company the right to continue its business as heretofore, within that judicial district.

The line of suits hinges about a point of patent law. Prior to 1897 the statute held that a foreign patent taken out in the United States expired at the same time as the foreign patent, but the law was amended in that year. The application for the Claude & Hess patent, under which the Prest-O-Lite Company has manufactured its product, was made before 1897, but was not granted until Dec. 25, 1900. The English right officially expired June 30, 1910. The English and American patents are somewhat similar. The defense has contended that the Prest-O-Lite patent is the same as the English grant, and since application was made prior to 1897 it has expired. The Prest-O-Lite contention, which has thus far been upheld, is that the English grant covers a "process," while the American covers an "apparatus."

COLE SALES DEPARTMENT.

Absorbs Henderson Selling Organization and Promotes Several Members.

Following the announcement a short time ago that the Cole Motor Car Company, Indianapolis, Ind., had absorbed the Henderson Motor Sales Company of the same city, came the news that Charles P. Henderson, who was at the head of the sales company, had been made general sales manager of the Cole company. H. C. Lathrop, who was secretary and treasurer of the sales company, is to have charge of the Indianapolis branch of the Cole company, with a large allotment of territory.

The large organization that surrounded Mr. Henderson and assisted him in the general success of the sales company, goes bodily to the Cole company, some advancements being made. Edward Harris, who was in charge of the promotion department, moves to the position of assistant sales manager; Jay D. Riker, who comes from the Parry Buggy Company, takes the promotion department; John A. Murphy, cashier of the sales company, becomes assistant secretary of the Cole Motor Car Company; E. E. Rogers remains in his same post; Homer McKee is advertising director; H. C. Bradfield takes the road as travelling newspaper consultant, while Harlow Hyde, a new man, has been taken on in charge of the detail work in the advertising department.

NEW GRAMM COMPANY.

Close Corporation Formed with Capital of $500,000 to Manufacture Trucks.

B. A. Gramm, who a short time ago retired from the Gramm Motor Truck Company, when John N. Willys, president of the Willys-Overland Company, Toledo, O., took over the former company, has become associated with M. Bernstein, a very wealthy and successful manufacturer in Lima, O., in a new corporation to be known as the Gramm-Bernstein Company. The capital stock of the new concern is $500,000, of which $300,000 is common and $200,000 preferred.

Fred Biszantz, designer and general superintendent, formerly with the Gramm company, and one of the best known men in his line in the country, is to be with the new organization. Mr. Bernstein, formerly a director in the Gramm company, is president; H. O. Bentley is secretary, and Mr. Gramm is vice president and general manager.

An excellent plant has been purchased in Lima. Additions are now under construction, which, when finished, will give a total of 125,000 square feet of floor space. The building is all of one story, steel constructed, with the most modern lighting system. Everything is light, airy and sanitary. The structures are located on the main line of the Pennsylvania and D., T. & I. tracks, providing the best facilities for shipping. Concerning the new company, Mr. Gramm states:

"We have been working up the business, and, no doubt, the country will expect the best trucks on the market from us, owing to our great experience in this business, having specialized in it for years. We are placed in a position where we have nothing to hold us back from producing the best. Already half of our next year's output is spoken for. Our aim is to build every truck a masterpiece, and produce the trucks in such a way that they will themselves become our best salesmen."

PRESIDENT JAMEISON DEAD.

Head of Abbott Motor Company Succumbs in Pennsylvania Home After Long Illness.

Charles W. Jamieson, president of the Abbott Motor Company, Detroit, died at his home in Warren, Penn., early in the month, after an illness lasting over a year. He had been kept to his bed since last December. A short time ago strong hopes of recovery existed, and the announcement of his death came as a distinct shock to the industry. The management and future plans of the company will in no wise be affected, it is announced.

Mr. Jameison became a heavy stockholder in the Abbott company on its reorganization two years ago. He was made president and had been one of the chief instruments in its development. His financial resources were large and he employed them freely in the Detroit enterprise. He was one of the largest independent oil refiners in the country; was president of the First National bank of Warren, and was heavily interested in mining and manufacturing.

For the past seven months the affairs of the Abbott company have been directed by F. M. Knapp of Warren, one of the directors. He will remain in charge.

PLANS FOR EXPANSION.

Republic Rubber Company Intends to Increase Capital Stock to $10,000,000.

Directors of the Republic Rubber Company, Youngstown, O., recently authorized the calling of a stockholders' meeting to be held early in August for the purpose of increasing the capital of the company from $4,000,000 to $10,000,000. The capital after the increase will consist of $6,000,000 common and $4,000,000 preferred.

No definite announcement has been made as to the amount of additional capital to be issued this year. It is understood, however, that the growth of the business will require new funds before another season.

The directors have also authorized the construction of a large modern reclaiming plant, which, with the completion of the five-story building now in course of erection, will give considerably greater capacity.

DUQUESNE CAR COMING.

Pittsburg Capitalists Organize Concern Which Will Locate in That City.

The Duquesne Motor Car Company, a close corporation, financed by a small number of leading business men in Pittsburg, Penn., has been formed, and will begin the manufacture of pleasure cars in the Pennsylvania city. About 250 men will be employed at the beginning, and it is planned to manufacture 500 pleasure cars as the first year's output.

Early in the campaign for the formation of the new company, the Industrial Development Commission of Pittsburg called attention to the fact that 45 per cent. of all the raw material used by automobile manufacturers was made in that city, and but few automobiles were manufactured there. The commission also called attention to the fact that the topography of Pittsburg would insure satisfactory results from any car that could withstand the tests made there. As a result of the commission's efforts the new concern was organized.

W. L. Rodgers, president of the Pittsburg Gage & Supply Company, is president. Oscar J. Howick, formerly designer for the Lozier Motor Company, Detroit, and Frank H. Morse, the engineer who developed the KisselKar, are associated with the new company, the former as designer and the latter as engineer. The company has established its plant at 30th and Liberty streets, where it occupies a floor area of 60,000 square feet.

The first model will be a four-cylinder, five-passenger car with 50 horsepower Wisconsin motor of the T head type. It will be equipped with an electric self-starter and electric lights. Designs are also being made for a six-cylinder, seven-passenger model. The company proposes to enter the field in the fall. The product will be known as the "Duquesne," and the trade mark will be the seal of the city of Pittsburg, enamelled in the colors of the city, black and orange.

The Duquesne Motor Car Company has a present nominal capitalization of $25,000, which will be shortly increased to $250,000. R. F. Rampsey of Pittsburg is the treasurer.

JOIN FLANDERS FORCES.

Two Former General Motors Company Officials Make Important Change of Interests.

C. A. McGee, general controller of the General Motors Company, and one of the most important factors in the recent successful reorganization of that concern, has resigned to enter the employ of the Flanders Manufacturing Company, Pontiac, Mich. Ford Hawes, another former General Motors Company official, and for 10 years chief engineer of the Cadillac Motor Car Company, has also joined the Flanders.

Mr. Hawes has, for a long time, been recognized as one of the big men in the engineering field as well as one of the "safest" designers of whom the industry can boast. His particular hobby has been attention to details, and he has been engaged for his new position as "detail engineer."

COLUMBIA TO REMOVE?

Chamber of Commerce in Dayton, O., Announces Acquisition of Plant from Hartford, Conn.

Through an announcement made by the Chamber of Commerce of Dayton, O., it became known recently that the Columbia Motor Car Company, Hartford, Conn., maker of Columbia cars, a subsidiary of the United States Motor Company, is contemplating the removal of its big plant to North Dayton, where already one branch of the United States Motor Company is located.

Eugene R. Mertens, for sometime general superintendent of the Columbia concern, recently left Hartford for Dayton to assume the post of general superintendent of the Dayton Motor Car Company. He is one of the best posted men in the country on the subject of gasoline engines, and was born in Belgium. As a boy he entered the employ of the Columbia company, taking a position in the machine room. He learned the trade of tool maker in the old Electric Vehicle Company and developed considerable skill. He became a tester and was soon promoted to the superintendency of the testing department. In turn he was made assistant superintendent of the Columbia concern, left to become superintendent of the Whitlock Coil Pipe Company, and later returned to his former employer as superintendent.

WILLYS-GARFORD COMBINE.

President of Overland Concern Adds Garford Company to His Present Holdings.

The agreement between the Willys-Overland Company, Toledo, O., and the Garford Company, Elyria, O., whereby the former has marketed the products of the latter, was dissolved recently, and John N. Willys, president of the Willys-Overland Company, took over the controlling interest in the Garford company. Following the disposal of his interests, Mr. Garford sailed for Europe in company with M. D. Johnson of Cleveland, O., his attorney and business adviser.

Mr. Willys has been elected president of the Garford company, and George W. Bennett vice president, these being the positions they hold in the parent Willys-Overland holding company. Vice President Bennett plans to spend one day a week at the Garford plant, as well as a day a week at the Gramm Motor Truck Company's factory, Lima, O., which recently also was secured by the Willys interests. The latest deal not only places Mr. Willys in direct charge of the sales of Garford passenger and commercial vehicles, but will also give him supervision over their manufacture.

STEWART TRUCK COMING.

Recently Organized Buffalo Concern Makes Announcement Relative to Its Product.

The new Stewart Motor Corporation, Buffalo, N. Y., recently formed by T. R. Lippard and R. G. Stewart, who withdrew from the Lippard-Stewart Motor Car Company, has secured the big plant recently vacated by the Niagara Machine & Tool Works at the corner of Randall and Superior streets, Buffalo. It will be put into condition for occupancy at once, orders for machinery, equipment, etc., now being placed from the temporary offices of the concern at 1056 Ellicott square. Every effort will be made to start manufacture at the earliest possible moment, so as to fill orders already received for early fall delivery.

The new company will manufacture light trucks. Mr. Lippard is president and general manager; Mr. Stewart, vice president and chief engineer; R. P. Lentz for several years connected with the London & Lancashire Fire Insurance Company of Hartford, Conn., secretary and treasurer, and Robert W. Ingersoll, recent manager of the Firestone Tire & Rubber Company of Buffalo, sales manager.

The new product will be known as the Stewart truck, being named after Mr. Stewart, who also was the designer of the Lippard-Stewart truck. Automobile men who are acquainted with the designs of the new product, proclaim it ahead of anything that has ever been placed upon the market, and say it is bound to meet a ready sale.

MECHANICAL POINTERS for GARAGEMEN AND OWNERS

SPLICING COUPLINGS.

A coupling of the Oldham type wears considerably when subjected to severe stresses and it is not always convenient to replace with a new one, especially if it be of large size. A car recently came into a repair shop with orders for a thorough overhaul, and in dismantling, it was found that a four-inch coupling was worn badly. To make one would require a large piece of stock and consume much time. The old part was rebuilt as shown at Fig. 1. The illustration, being self explanatory, presents the manner in which the metal was smoothed up, and wedged shaped pieces fitted and riveted.

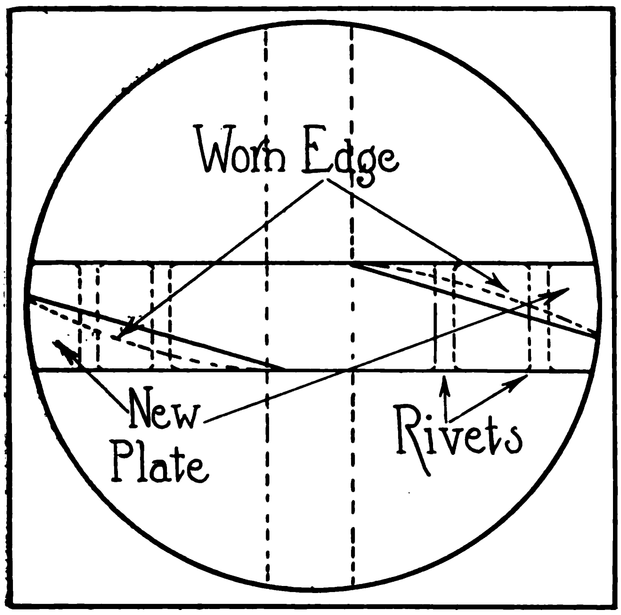


Fig. 1—Method of Repairing Worn Oldham Coupling.

FITTING WITH SPARK PLUGS.

The average motorist who purchases new spark plugs to replace old or faulty members does not take into consideration the fact that to obtain the greatest efficiency from the motor the plugs should fit properly. Usually if the plug be gas tight and ignites the mixture the automobilist is satisfied. The construction and location of these members are of vital importance and engineers and designers have given a considerable amount of study to the subject.

It is well known that spark plugs are subjected to great changes in temperature and consequently those of expansion and contraction. The distance of the so-called spark gap must be maintained in accordance with the engine requirements and with the current with which it is used.

With the introduction of the high-tension magneto it was found necessary to design a plug to meet the peculiar requirements of this current. Ordinary spark plugs when utilized with a high-tension magneto gave trouble, owing to the intensity of the current burning the points and increasing the gap, and heat resisting materials are employed in the construction of the electrodes.

With the magneto plug two or more electrodes are fitted, each having approximately the same sized gap. The current will invariably pass across the gap presenting the least resistance and should its electrode burn away slightly it would offer greater resistance so that the current would seek one of the other gaps.

Location Is Important.

The best and most scientifically designed plug will not give satisfactory results if its location in the cylinder be incorrect. In order to obtain the greatest efficiency from the motor the time required for the spread of the flame through the charge of mixture should be as brief as possible, and to secure this end the spark plug gap should be located in the combustion space, and not in a pocket or recess. If the latter conditions exist, such as shown at Fig. 2 A, dead gas will accumulate about the electrodes, causing slow combustion and missing.

The action of the motor may be improved considerably by boring out the valve cap, allowing the plug to set down so that the points of the member will project into the combustion chamber as depicted at B. The spark will then come in direct contact with the clean and fresh mixture and the flame will spread with maximum rapidity. The plug should preferably

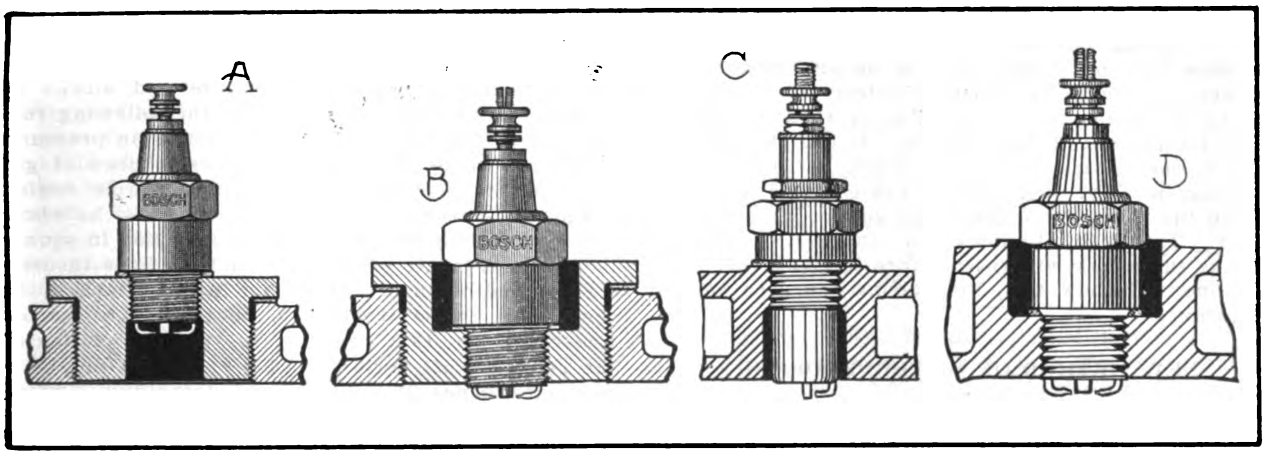


Fig. 2—Outlining Positions of Spark Plug in Cylinder: A, Poor Location, Creating Pocket for Dead Gas; B, Proper Position, with Points Extending into Combustion Chamber; C, Faulty Design, Exposed to Heat; D, Showing How Same Valve Cap May Be Bored to Obtain Correct Location of Plug.

be located in the immediate neighborhood of the intake valve and in such manner that it will be surrounded by the fresh gas that enters on the inlet stroke. If the plug be located on the exhaust side there is a liability that dead gas will collect around its points causing faulty action.

Obtaining Best Results.

In order to obtain the best results the plugs should be so set in the cylinder that cooled metal is in proximity to the sparking points, as in this manner possible overheating of the points will be eliminated. A plug that is not cooled properly will overheat and the points will become incandescent, creating trouble. The plug should not extend too far into the combustion chamber as in this position it would be subject to undue heating.

If, on the contrary, the desired length of the plug is made up by extending the barrel, or that portion above the thread, the metal of the electrodes will be adjacent to the cooled metal of the engine and the heat will be transferred readily. On some motors the plug is set in the cylinder wall in such manner that it must project through the water jacket, and extension plugs are required in order to prevent the pocketing of gas.

At C is depicted a plug so located that a pocket is provided. Considerably better results will be obtained on engines of this type if the spark plug hole be made large enough to permit the thread to be cut at its very bottom, as shown at D, for in this manner the plug will be cooled properly.

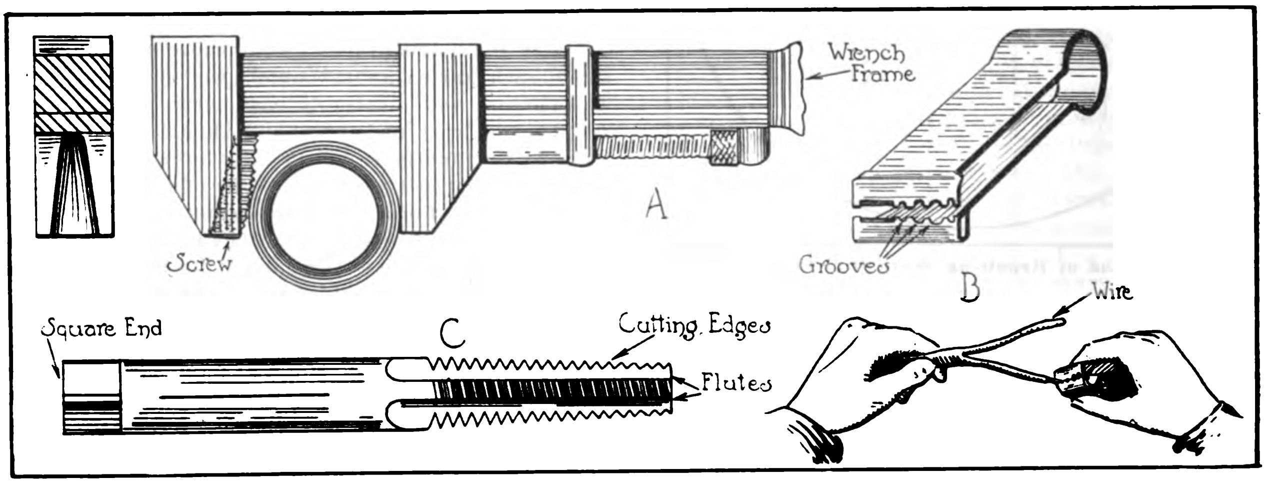


Fig. 3—Handy Devices in the Shop: A, Utilizing the Monkey Wrench as a Pipe Wrench; B, Wire Stripper; C, Marking Small Taps to Prevent Breaking.

A TAP SAVING KINK.

In tapping out small holes it is very annoying to have the tool break, as this usually means the broken part must be annealed before it can be removed from the work. At Fig. 3 C is shown a kink for preventing this trouble. It consists of cutting a line parallel with the shank, as outlined in the sketch. The tool is then heated, half way between the threads and the shank end, to a light blue color. This will eliminate the chances of breakage as the shank will twist before it gives way, and the line will show this, thus giving the user ample warning.

NEW METHOD OF WATERPROOFING.

After quite an extensive series of experiments, experts connected with the French army have fixed upon a new method of waterproofing fabrics which is claimed to be superior to the usual processes. This includes the use of acetate of aluminum, which, when applied to the material can be made to form alumina, or aluminum oxide, in a gelatinous state, and volatile acetic acid. When the fabric thus treated dries it is waterproof but does not become air proof, one objectionable feature of rubber and other materials. It is also quite supple, a necessary quality for goods from which clothing is to be made. The bath is composed of one part of the acetate to 40 of water, in which articles are soaked for 24 hours and then dried in the air, after which they will be found ready for use.

Hitherto English manufacturers have been in the lead in bringing out waterproof fabrics. Besides rubber, there have been used insoluble gelatine, boiled linseed oil, metallic soaps and some others with more or less success, but this new process is considered the best by competent authorities. The acetate of aluminum solution can now be found in the general market and does not need to be specially prepared, as was formerly the case.

THE USEFUL MONKEY WRENCH.

The monkey wrench with several attachments can be made to fill many wants, and at Fig. 3 A is shown a simple method of converting it into a pipe wrench. This will provide a handy tool to carry in the kit when called out on an emergency job, as it will serve a double purpose. To make the device, a small groove is milled on a taper as outlined in the sketch. In this is placed an old piece of a bolt or stud the treads of which have been hardened. This will prevent the wrench from slipping around the pipe.

TWO-STROKE VS. FOUR-CYCLE.

It is a general belief, in theory at least, that a two-stroke motor should develop twice the power of a four-cycle engine of the same bore and stroke of cylinder, but this is not correct for the following reason: If two motors have equal compression pressure, then that which receives the greatest charge of gas develops the most power. In the four-cycle engine the maximum theoretical amount received is the whole volume swept by the piston. Area of piston in square inches times length of stroke in inches equals theoretical volume of charge drawn in, in cubic inches. In the simple two-stroke motor the theoretical charge received is not that swept by the piston, because of the open exhaust ports. In this case, area of piston in square inches times (length of stroke minus width of exhaust port in inches) equals theoretical volume of charge, in cubic inches. It is clear therefore, that, for equal bore and stroke, the simpler two-cycle engine cannot develop twice the power of a four-stroke motor, of the ordinary type of construction.

The latter has its defects, however. For instance, in Fig. 4 is shown a theoretical indicator diagram taken from a kerosene engine, in which horizontal distances represent the stroke of the piston (and therefore the volume swept out by it), and the vertical heights indicate pressures acting upon this member. The line A A represents atmospheric pressure; the line B B, a perfect vacuum or zero pressure. Imagine a cylinder with its piston at the top of the exhaust stroke. At the end of this movement the pressure has not reached that of the atmosphere because there is of necessity a certain amount of back energy in the muffler. But the gasoline vapor which the engine must draw in from the carburetor has an atmospheric value and cannot enter the cylinder until the pressure therein has fallen below that.

If the motor be fitted with automatic intake valves, the atmospheric pressure from the outside cannot open these and send in vapor until the piston has moved sufficiently far down to allow the dead gas in the cylinder to expand. Even then, there is a further delay owing to the inertia of the valves and their gradual opening. With the mechanically operated form there is a slight advantage, in that they are raised and quickly lifted off their seating by the action of the cams, but even in this case the fresh charge cannot enter through the open valve until the piston has moved downward and allowed the dead gas to expand less than 14.7 pounds.

On the return stroke the charge is compressed, and the length C D indicates the volume of gas drawn in, measured at atmospheric pressure and it will be noted how very much smaller this is than the ideal volume; that is, the whole amount swept out by the piston.

Returning to the simple two-stroke engine and its open exhaust port: It generally will be found that the height of this is about 35 per cent. of the whole stroke of the piston. Hence, for cylinders of equal bore and stroke, and assuming the same efficiency at the inlet, the volume of charge would be:

$$\frac{\text{Two-stroke motor}}{\text{Four-stroke motor}} = \frac{65\%\text{ of the length of stroke}}{\text{Length of stroke of piston}}$$

Hence also, theoretical power developed by:

$$\frac{\text{Two-stroke motor}}{\text{Four-stroke motor}} = \frac{2 \times .65}{1} = 1.3$$

Assuming that the compression pressures in the two engines are equal, so that in theory their thermal efficiencies should be the same: It is obvious that the two-cycle, even under the most favorable conditions, cannot develop more than 1.3 times as much power as the four-cycle. Also that the crank chamber into which the charge is drawn from the induction pipe is in direct communication with the working cylinder through the inlet port when the piston is at the bottom of its stroke, and hence induction cannot begin until the piston has moved up sufficiently to cover this port.

Then the gas already in the crank chamber has to expand slightly below atmospheric pressure (it being now at the exhaust pressure corresponding to that in the working cylinder) before the automatic inlet valve will open. It would be quite correct to assume that the height of the inlet port is 15 per cent. of the working stroke of the piston, so that the greatest volume of charge which the two-stroke motor can draw in is only 85 per cent. of that drawn in by the corresponding four-cycle engine.

The crank chamber of the motor may be regarded as a pump cylinder, but there must be space enough within to allow the crank arms and large end of the connecting rod to rotate freely, and even when this is reduced to a minimum it is difficult to see how the volume of the crank chamber and connecting pipe can be made less than that swept out by the underside of the piston in its travel (reckoned between the top end of the stroke and the top of the inlet port in the cylinder wall). At the commencement of the down-stroke, then, we have in the crank chamber the working volume (reckoned down to the top of the inlet port) plus the clearance (in which the crank rotates) and assuming these two equal, this gives us twice the former. The pressure now will be at least three pounds a square inch below atmosphere if crank chamber has an automatic valve. Assume it is 12 pounds, absolute. The minimum pressure in the working cylinder into which the charge eventually must be forced cannot be less than three pounds a square inch above atmosphere with any ordinary muffler. Assume it is 18 pounds.

The ratio of pressure is $12 \div 18$, and therefore that of volume is nearly two-thirds. This means that when the pressure in the crank chamber has risen to 18 pounds a square inch absolute, the space occupied by the gas is approximately 1.3 times the working volume. Deducting now the clearance, which always remains the same in the crank chamber, only one-third is left with which to fill the cylinder. Eighty-five per cent. of .33 is only .28, so that, instead of the simple two-stroke motor receiving 65 per cent. of the charge as with the four-cycle engine, it only gets

$$\frac{.28}{.65} = 43$$

per cent. of this. As the result, therefore, instead of developing 1.3 times the power of the equivalent four-stroke engine, the two-cycle can develop only 43 per cent., or a trifle over one-half as much.

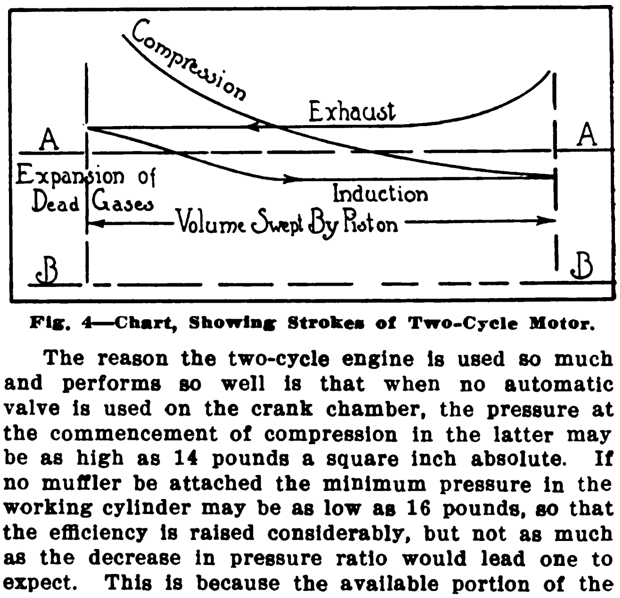


Fig. 4—Chart, Showing Strokes of Two-Cycle Motor.

The reason the two-cycle engine is used so much and performs so well is that when no automatic valve is used on the crank chamber, the pressure at the commencement of compression in the latter may be as high as 14 pounds a square inch absolute. If no muffler be attached the minimum pressure in the working cylinder may be as low as 16 pounds, so that the efficiency is raised considerably, but not as much as the decrease in pressure ratio would lead one to expect. This is because the available portion of the stroke for drawing in the charge is still further cut down by the second or transfer port.

TECTORIUM, A SUBSTITUTE FOR GLASS.

A material that is said to be exceedingly flexible, strong, impermeable, and very well adapted as a substitute for glass is prepared by applying a varnish to a finely meshed iron-wire fabric. The material consists principally of good linseed oil in which the netting is dipped as many as 12 times. After each immersion the thin layer of oil is dried in warm air.

Reducing Tire Friction—When fitting an inner tube in a tire at any time, a little ground talcum, the talcum powder of daily use, placed on both, or shook freely into the shoe will reduce materially the friction between the two. In this way, the members will wear longer, while the internal heating will be reduced to a minimum. Powdered graphite also is recommended.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Rutenber Engine Lubrication.

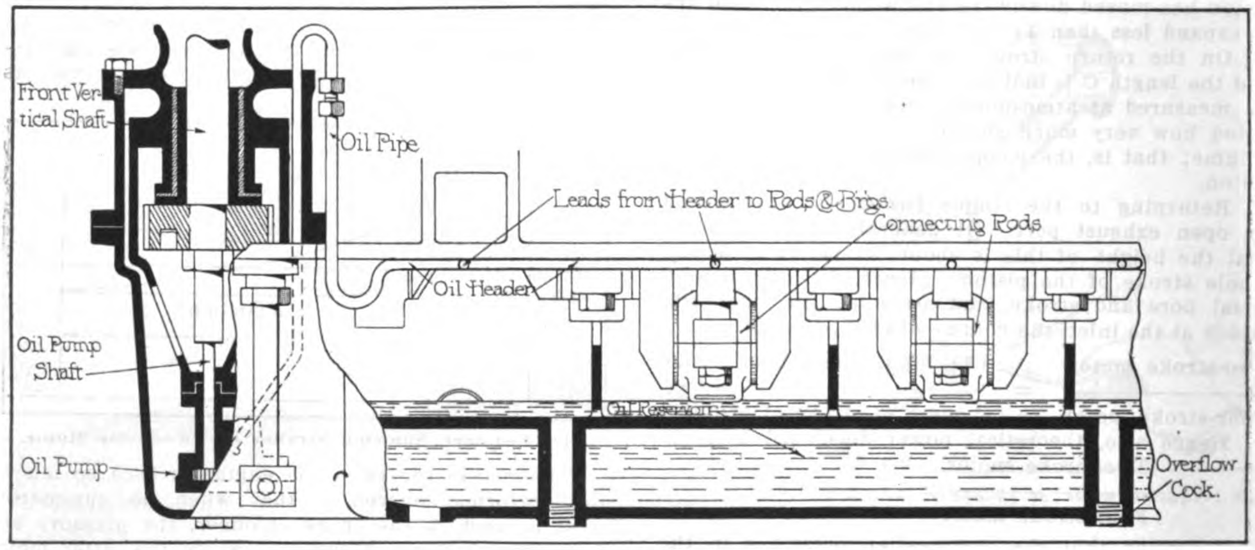
(84)—I noticed your article, in a recent issue of one of your publication on "Lubrication," but failed to find anything in it, either descriptive or in the way of illustrations, concerning the Rutenber engine. Now, my car has a Rutenber motor in it, and although I understand the lubricating scheme, I would like to see it illustrated and described in the columns of your valued paper.

THOMAS F. JAY.

Willimantic, Conn., June 25.

The space possibilities crowded out the description of the lubrication scheme noted, although our correspondent is mistaken as to its not being mentioned. It was stated in the article that this make of engine worked on the constant-level-using-a-pump method, forcing the oil to a header along the side of the engine.

As the illustration below shows, this is a good, though brief description of it. The oil pump is located at the front of the motor, being placed at the bottom of a vertical shaft, the upper end of which drives the timer or similar accessory. This pump is shown within the forward compartment of the engine, but may be located outside if desired, this latter position making it more accessible.



Sectional View of Crankcase on Rutenber Engine, Showing Method of Lubrication Utilized.

This pump drives the lubricants, received from the reservoir in the bottom of the crankcase, up through a vertical pipe to a header. The vertical pipe may be broken at the union shown for the purpose of inserting a sight feed if desired. The header is simply a good sized pipe along the side of the engine with the oil flowing in at the end, and out through drilled holes to the bearings and onto the connecting rods.

Excess oil flows off into the crankcase, where overflow holes allow it to pass into the reservoir below. These overflows are set so high as to maintain an oil level, into which the rods will always dip, splashing the lubricant around the case and to all parts not otherwise reached by the oil leads from the header.

Semi and Full Floating Axles.

(85)—Will you please explain the difference between a semi-floating and a full floating rear axle? Also between a reversible and an irreversible steering gear?

JAKE W. LIEBEN.

New Bedford, Mass., June 23.

A semi-floating rear axle is one in which part of the weight of the vehicle is supported upon the axle shaft, while in the full floating axle, none of the weight is borne by the axle itself. In the latter case, it is possible to remove both halves of the axle and leave the car standing on the wheels, the load being carried on the axle housings.

A reversible steering gear is one in which the road shocks are transmitted through the steering gear back to the driver's arms and hands, while an irreversible type is one in which the character of the gearing used is such as not to transmit any road shock to the driver. The latter is the best one to use for this reason, but the former must sometimes be utilized because of its low cost.

With the former type, should one front wheel hit the curbstone, the shock of this turning action might throw the driver—if he should continue to hold onto the steering wheel—out on his head. This type is dangerous because it is almost impossible to avoid striking obstacles at times.

Fuel Injection Queries.

(86)—Will you explain to me the present status of fuel injection? About a year and a half or two years ago, there was considerable talk about this, and I believe a number of cars were turned out, the engine in which had the gasoline supplied in this way. What was supposed to be the special economy of this method, less fuel or less complication?

VOLNEY R. DAVIS.

Freeport, Me., June 21.

Except for a few marine and stationary engines of the Diesel type, and one or two which have been tried in flying, the situation is as it was two years ago in the matter of direct fuel injection, unless it be that designers have discovered this method brings more complication rather than simplification. About that time, two cars were brought out which had motors supplied with fuel by pump instead of carburetor. One of these was a Wisconsin product, while the other hailed from New England.

If a simple pump of few parts, reliable in action, and possessing other qualifications can be developed, it will be of considerable use in rotating engines of the Gnome and Adams-Farwell type. At present the former takes its fuel through a hollow crankshaft, while the American make is fitted with a form of distributing chamber from which radial pipes run to the cylinder heads.

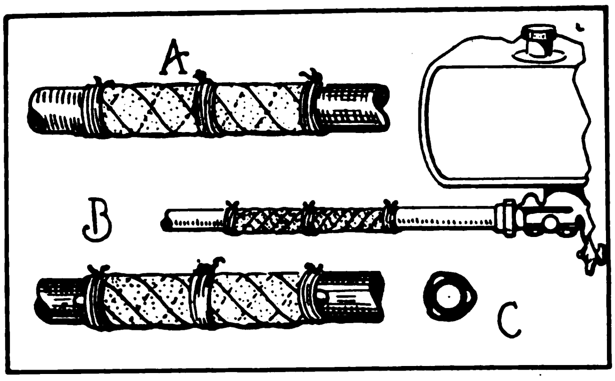
Why Wheels Are Dished.

(87)—Why is the distance between the front wheels of an automobile greater at the top than at the bottom?

WILLIAM BAMFORD.

North Andover, Mass., June 12.

The greater distance is due to the dish or concavo-convex of the wheels. It has been found that this construction better withstands side stresses than when the spokes are all in one plane. The reason for the slight incline is that the wheels have a tendency to fly out when running at high speed under load, and the slight dipping is designed to overcome this tendency, so that they are at all times in a plane perpendicular to the ground, in which position they are able to withstand the greatest loads. Dishing may be brought about by bending the axle down slightly, which movement increases the distance at the top and diminishes that at the bottom of the members.



Method of Repairing a Broken Fuel Pipe.

Repairing Gasoline Pipe.

(88)—Will you please inform me how a temporary repair can be made to a broken gasoline pipe? I had one break while on the road and experienced difficulty in getting home as in spite of my efforts to stop the leak, I lost considerable fuel. CHARLES C. JAMES.

Indianapolis, Ind., June 15.

One of the simplest methods is to utilize a section of rubber tubing which is slipped over the metal pipe, but if the break be in the centre of the line the vibration would tend to chafe the rubber. The latter should be braced by splints and the manner of attachment is shown at C. Where this is not obtainable a repair may be made with ordinary friction tape. Strips of wood are laid lengthwise and in the same direction as the line and the tape wound as depicted at A, being tied with twine. The wrapping should be snug where the break occurs to prevent leakage of the fuel. At B is shown the work completed. A small crack may be treated in a similar manner or by using soap and tape as the former is not affected by gasoline; in fact, a piece of this material is invaluable in the tool kit.

Vulcanizing Rubber with Flat Irons.

(89)—I noted in a motoring journal a method of vulcanizing rubber with flat irons. I have tried it with ordinary rubber and sulphur, but cannot make it work. I should like to know what kind of rubber to use and how it is done? RALPH SAFFELL.

Farmington, N. M., June 23.

Your failure to vulcanize successfully was due probably to the fact that you employed a cured rubber. When the vulcanizers are employed utilizing flame and heat vapor, such as the portable outfit included in the motor car equipment, the materials used consist of uncured Para rubber stock, and a special vulcanizing cement that contains a certain percentage of sulphur. The most important point is that the temperature be regulated properly. Excess heat will burn the material, and too little will not effect a proper cure. The temperature at which vulcanizing occurs varies from 250 to 275 degrees Fahrenheit. The first step in the process is to clean all parts thoroughly, then trim the rough edges carefully. The surface is next roughed with emery cloth and the vulcanizing cement applied, two coats being enough, the first being allowed to dry before the second is put on. The pure rubber is placed over this and a strip of cloth laid between it and the vulcanizer. After the proper temperature is reached the instrument is allowed to remain in contact for 15 or 20 minutes, according to the size of the repair. Considering the application of flat irons the difficulty would be in securing and maintaining the proper temperature.

Making Simple Rod Ends.

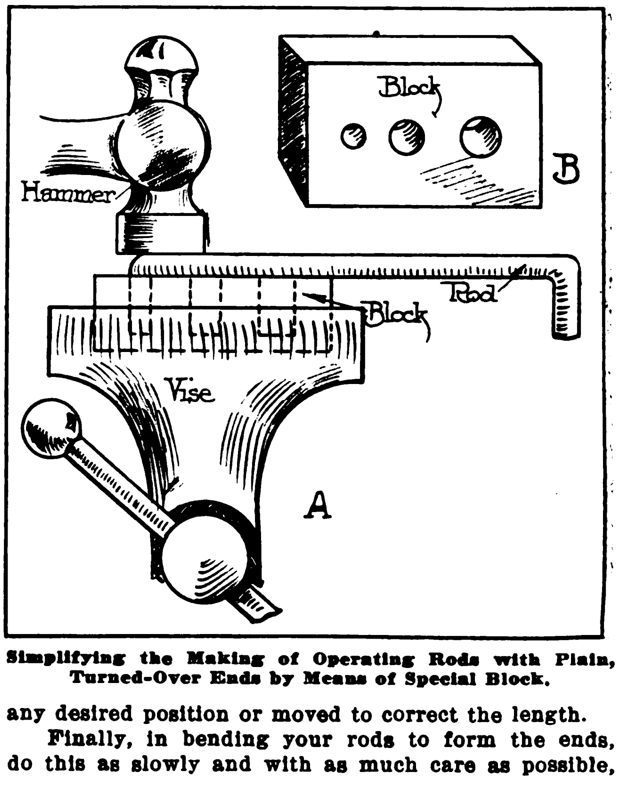
(90)—Please give me some advice in taking care of my car and making repairs for it. It is a ———, which I have had about a year and all of the operating rods have perfectly plain ends, made by bending the stock through a right angle. This bend is then pushed through the operating lever, a hole drilled on the opposite side, and after putting a washer over it, a cotter pin retains it in position. The principal trouble I have had has been with these ends bending and breaking off. I usually go to a blacksmith and have a new one welded on and bent to shape, but this always makes trouble in two ways. The length is not quite correct, requiring extra work to make it fit in place, since there is no adjustment, and many times the diameter of the new piece is such that it is a very snug fit, requiring much filing and fitting, as well as hard driving to get it through the hole. D. W. G. RUSCOE.

Freehold, N. J., June 22.

This form of rod end seldom fails to give trouble, but in your case it will be well to arrange matters so as not to have it occur again. Have a block made at the blacksmith's, and take this to a machine shop, where three holes can be bored in it. These should vary in size slightly, from .0625 inch below the actual diameter of rod used to the same amount above. Possessing this, when it is desired to make a new member, you can do the work yourself as shown in the accompanying cut at A.

The block is held in the vise, and the rod after bending, is stuck into one hole, then the hammer is employed to finish the work. In purchasing stock, buy soft iron, or as the smith would doubtless call it, Norway iron. It also is advisable to use a size slightly larger than that utilized previously, boring out the holes in the various levers to take this. If that be done, a less amount of trouble will be encountered because of the larger wearing surface and greater strength afforded.

As for adjustment, the best plan is to buy a turnbuckle at the nearest hardware store, cut your rod at the middle or other convenient point, thread each end, and screw on the connection. By means of lock nuts placed on either side of it, this can be located in any desired position or moved to correct the length.



Simplifying the Making of Operating Rods with Plain, Turned-Over Ends by Means of Special Block.

Finally, in bending your rods to form the ends, do this as slowly and with as much care as possible, drawing out considerable excess of metal to help from the corner. In this way, the strength of the fibres may be preserved, and the section kept large so as to have full strength where the strain comes.

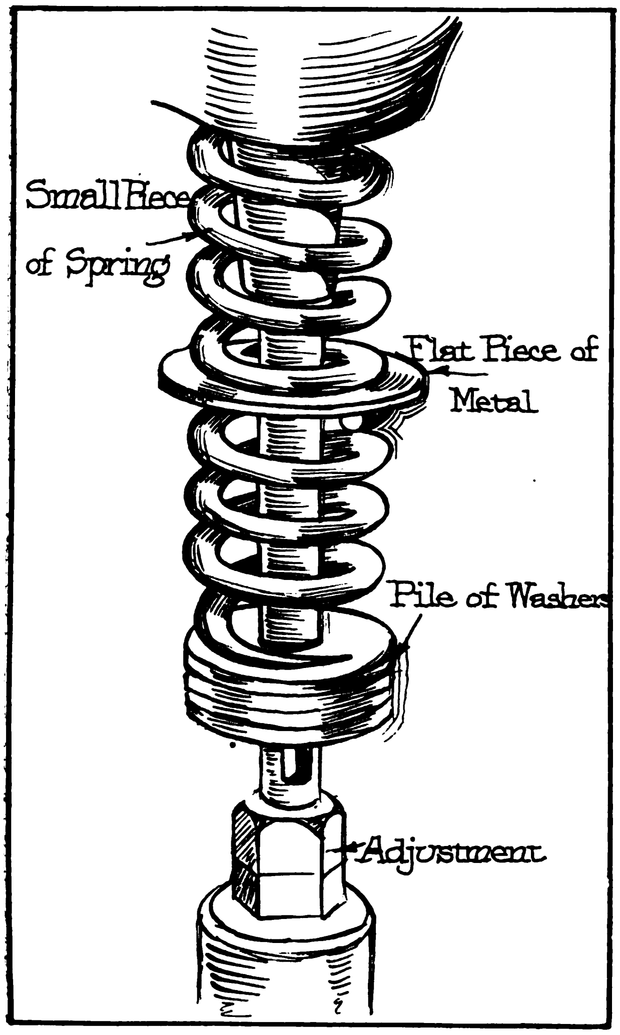
Ratio of Power to Speeds.

(90)—Kindly explain a matter which is puzzling me greatly. It is relative to the speed and power of racing cars. If an automobile of 50 horsepower will go at the rate of 90 miles an hour, why will not one of twice as much power or 100 horse, travel just twice as fast?

S. V.

Huntington, L. I., June 19.

The resistance to speed is based on a number of quantities, and the variation in these causes the difference in the rate of travel with the amount of power available. Thus the speed is lowered by the necessity for overcoming the air resistance, this increasing approximately as the square of the rate of motion. If it took a certain amount of power to overcome this at say 90 miles an hour, this being represented by 10 at twice that or 180 miles, the resistance would be indicated not by 20 but 100.



Two Methods of Strengthening Weak Valve Springs: Above, Added Member; Below, Extra Washers.

Another source of speed loss lies in the traction which the wheels can secure. At slow rates of travel this may be comparatively high, as the wheels are always in contact with the ground and the distribution of weight is doubtless such as to make for considerable adhesion. When moving rapidly, however, it has been proven that the wheels are off the ground a very large portion of the time, during which period much traction is lost, and the forward progress of the vehicle delayed accordingly.

As a third item in speed work, mention might be made of the losses due to the ventilation of the wheels; that is, the additional resistance to the air set up by the rapidly rotating spokes and other parts.

Some recent tests made in France with a 30 horsepower car shed considerable light on this problem. This machine was driven at varying rates and the loss due to many different causes determined. At 43 miles an hour on the level, the power delivered to the crankshaft was divisible into four parts; the transmission took up 13.7 per cent., the wheels and rims absorbed 22.9 more, ventilation consumed no less than 2.3, while air resistance required just 61.1 per cent. of the total.

On the basis of the previous assumption that the resistance offered by the air varies as the square of the speed, and considering the figure just given, 61.1 per cent. absorbed at 43 miles an hour, it readily can be seen that speeds of double this or more require enormous power plants.

Since it is a simple matter to increase an existing engine, one can reason backwards from the records which now exist that something more than just horsepower determines the rate finally attained. Were this not the case, the maker of any car could put a second motor back of the first and double his speed with little or no expense or trouble. As a matter of fact, the huge expense, special designing, use of particular materials, and many other similar items in connection with the production of a "speed monster" to reduce existing records is well known.

A secondary matter of a practical nature in this connection is that of tires. Some of the blows struck these by the impact of the car on the ground after it has been shot off into space by striking a small bump when going at a terrific rate of travel have a value in foot pounds of energy which could only be produced by a very large trip hammer, and one which rubber filled air was never designed to withstand. Coupled with this pounding action is the matter of heating. During a speed dash, as an attempt at a 50-mile record, the outer portion of the shoes becomes so heated that the hand cannot be held upon it.

Strengthening Valve Springs.

(91)—Will you please advise me if there is any manner in which I can stiffen or strengthen the springs operating my valves? They have become very weak and allow the valves to open with the suction of the piston when they should not, as on the power stroke, and also hang open long after they should have been closed by the spring. I have taken up the adjustment until there is no more to go, while the people who made my engine have gone out of business, so I have no one to apply to for new springs. Would stretching them do any good, or, rather, would it make a permanent job?

J. WILSON VANDENGORDER.

Jersey City, N. J., June 17.

There are two good methods by which springs in the condition described above can be remedied so as to give good results as new ones, both at small or no cost and very little work. These are shown in the accompanying figure, at the top and bottom.

In effect, the spring must be lengthened, although stretching will do absolutely no good, the time saving being less than if the member were renewed and repaired properly. It may be made longer by cutting and setting a thick piece of metal or washer between the two pieces, in which manner about .25 to .5 inch may be gained, or a similar but shorter spring may be obtained and placed above the present one with a washer between the two.

While this scheme will work well, if a small amount be needed, washers may be added either above or below the cup, in such manner as to reduce the distance between the two points of support.

PROF HORSFORD IS MANAGER.

Prof. Winthrop C. Hosford, M. E.

The many friends of Prof. Winthrop C. Hosford, M. E., chief instructor of the Boston Y. M. C. A. automobile school, will be glad to learn of his promotion to become manager of this institution. The school itself enjoys the distinction of being the first of its kind in America, and its reputation has been such as to place it in the very front rank of progressive and effective institutions of this character.

Prof. Hosford has served for several years as chief instructor, and the constant and growing success of the school is attributed largely to the system and methods employed by him. Over 5000 men,—chauffeurs, operators and others connected with the industry in various capacities—can testify to his skill as a teacher and to his genial personality.

Born in New Britain, Conn., Prof. Hosford entered a machine shop at the age of 16. During the next four years he studied machine drawing and designing evenings. He entered the automobile field in 1898, when he became identified with the New England Motor Carriage Company. For the past 14 years he has been connected with the industry continuously in some capacity.

The promotion comes as a fitting tribute to his energy and painstaking efforts on behalf of the school. He is not only a hard worker, but studies constantly, keeping abreast of the improvements and developments of the modern automobile. In his work he is assisted by 16 instructors, all of whom are trained and experienced in their respective branches. In this manner the highest possible standard is maintained at all times.

HILLS IS SUPERINTENDENT.

Clarence A. Hills, son of Mr. and Mrs. F. O. Hills of Prescott street, Torrington, Conn., has been made superintendent of the Abbott Motor Company's works at Detroit, Mich. For the past two years he has been connected with the Hupp Motor Car Company of Detroit, maker of the Hupmobile, in the same capacity. At the close of his engagement a short time ago the employees of the firm gave him a gold watch and the officers of the company presented him with a diamond stick pin.

As a boy, Mr. Hills took his first lessons in mechanical drawing in the Y. M. C. A. classes at Torrington. Later he went to a technical school in Kingston, R. I., and then took a position with a manufacturing concern in Bantam, Conn. As soon as he had earned sufficient money he went to Ann Arbor, Mich., where he completed a course in mechanical engineering and at once accepted a position with the Olds Motor Works in Detroit as draftsman. When this plant was removed from Detroit to Lansing, he secured a position with the Chalmers Motor Company, leaving the latter concern to go with the maker of the Hupmobile.

FOREIGN STUDEBAKER AGENT.

W. H. Lalley has been appointed foreign sales manager of the Studebaker Corporation, Detroit, after having been in charge of the European sales of the company for the past two years. He has established branches in London and Berlin, and is one of the directors of the Studebaker Corporation of England, Ltd. Besides having had considerable experience with the foreign sales of the Studebaker, he is a technical man, being a graduate of the Massachusetts Institute of Technology. His many friends throughout the industry will be glad to learn of his appointment.

WINS DESERVED PROMOTION.

Ernest L. Smith, Manager Rhode Island Oldsmobile Branch.

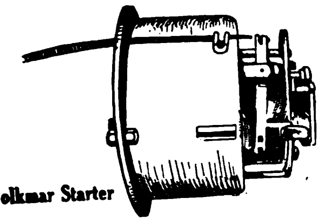
The Rhode Island branch of the Olds Motor Works, which was established the first of the year, is in charge of Ernest L. Smith, who was transferred from Boston to Providence at the time the branch was opened. Mr. Smith was for years a commercial salesman and when he decided to become identified with the automobile industry he made a connection with the sales department of the Olds Motor Works and was stationed at Boston. Mr. Smith's home has been at Pawtucket, R. I., for years and he is widely and favorably known.

When the company decided that a branch was necessary in Rhode Island in order to give its patrons the consistent attention and service they were justified in expecting, Mr. Smith was named as the manager. This was followed by the opening of admirably located salesrooms at 77 Exchange street and the establishment of a service station in Broad street. The policy of the company is to give to Oldsmobile owners factory attention and to deal with them direct instead of through an agent. The Rhode Island branch has the equipment and the facilities to deal with any condition that may arise, and Mr. Smith says that the satisfaction this insures will be realized.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Volkmar Starter is made by the Volkmar Auto Starter Company, 203 Broadway, New York City, and is of the spring type, the motor being turned over by means of two steel springs. It is simple in construction there being but 28 parts, all exposed to view by removing the brass cover, as shown in the illustration. The starter is attached in place of the starting crank and needs no alteration of the car before it can be installed. It is eight inches in diameter and seven inches long, and is operated by a pedal connected to which is a flexible cable. Depressing the pedal releases the springs, which turn over the motor. When the motor starts, it rewinds the springs to the original tension, when they are disconnected from the crankshaft and held tightly until the next time it is desired to start the car. Two types of the starter are made, A for cars with motors of up to 30 horsepower, and B for cars of up to 60 horsepower, weighing 35 and 45 pounds, respectively.



Volkmar Starter

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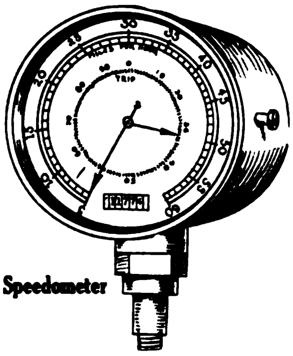
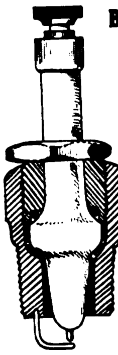
The Reliance Speedometer is made by the Reliance Speedometer Company, Boston, in a number of styles. It is of the centrifugal type, with an evenly balanced ball governor which makes the indication of speed steady. It is provided with speed and trip hands and a season odometer. The trip hand may be set to any desired reading by means of a screw. The construction of the instrument is substantial, with ball bearings at every point. Noise is prevented by the use of hard composition ring gears having cut teeth and running with a fibre pinion. Accuracy is secured by the fact that each instrument and dial is calibrated individually. The trip hand moves continuously. The finish may be had in brass, nickel, black, brass and black, or nickel and black. A feature of the Reliance installation is the swivel drive and ball bearing shaft. The drive is ball bearing, swivels, and is provided with spiral gears, insuring quietness and smoothness, and eliminating chances of breakage. The flexible shaft, provided with ball bearings, serves to give a steady drive, eliminating sudden jumps in the indication and also guarding against shaft breakage. A swivel is provided at each end of the shaft.



Reliance Speedometer



Buscoba Spark Plug

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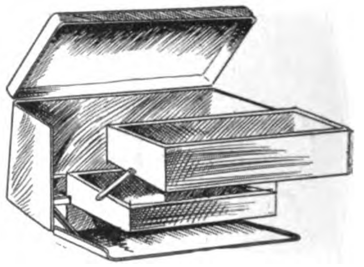
The Buscoba Spark Plug is made by the Bush-Scott Company, Detroit, and may be had in conical and petticoat types in .5-inch standard, S. A. E. standard, or metric sizes. The shells are full length and handsomely finished. When the plug is taken apart for cleaning the copper asbestos gasket is retained by means of a recess in the bushings, which are hardened to prevent bruising, adding to the life and service of the plug. The porcelains are accurately formed of a special heat resisting material and are interchangeable, with the caps well crimped in place and filled with cement to exclude oil and water. The sparking points are made of a special alloy which approaches platinum in its resistance to heat and the electric spark. The binding post and nut are so formed as take a great variety of cable terminals. The packing of the plug consists of asbestos filled copper gaskets of standard type.



Gray Tool Box

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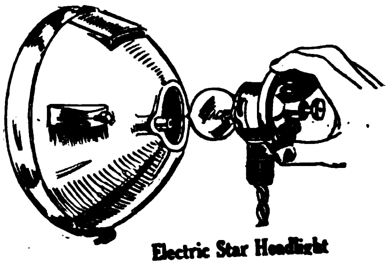
The Gray Tool Box is constructed with the trays on movable arms so that they may be pulled out and held in such position that all the contents are in view at once, an obvious convenience in searching for tools. The front is hinged and may be used as a shelf with the box bolted on the running board. The device is provided with a brass trunk lock and is made by the Gray Specialty Company, 148 Avon avenue, Newark, N. J.

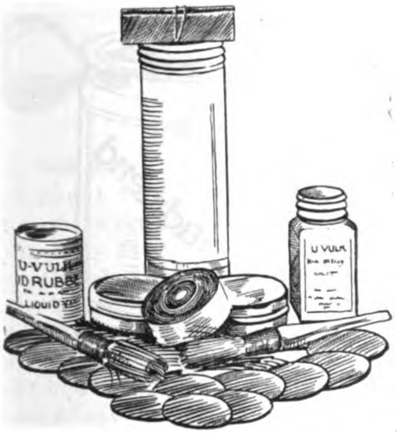
★

Electric Star Headlights are made by the Milwaukee Bronze Casting Company, 119 Clinton street, Milwaukee, Wis., and are designed to throw a powerful white light straight ahead and at the same time diffuse a less brilliant illumination to the side, lighting up the curves and passing vehicles so as to reduce the risk of collisions. This double ray effect is secured by the design of the reflectors, which are of modified parabolic form. The lamp is cast of non-corrosive silver aluminum about .1875 inch



Electric Star Headlight

thick, without any rivets to jar loose or solder to crack because of the vibration to which automobile lamps are subjected. The interior is brought to a high polish which is unaffected by the weather or gases, due to the composition of the metal. The lamp is equipped with Ediswan bayonet lock base, which will not allow the bulb to become loose. A feature of the member is a focussing device which enables the bulb to be focussed in a position which will give the illumination desired. This is controlled by means of a screw and lock nut on the outside of the hub which carries the bulb.



U-Vulk Repair Kit

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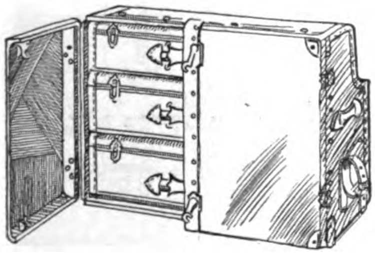
U-Vulk is a vulcanizing outfit which is complete in itself, containing patches, brushes, rubber in strips and in solution, and a liquid vulcanizing agent which chemically vulcanizes the raw rubber to the tire or tube. It renders tire repairs possible without heat, and comes in a compact form, fitting in a pasteboard screw top carton. It is made by the Gem City Liquid Vulcanizer Company, Dayton, O.

* * *

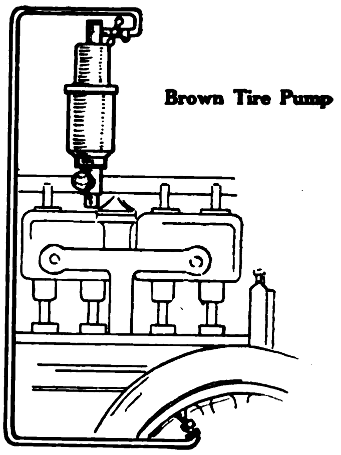
Ajax Trunks are made by the Ajax Trunk & Sample Case Company, 91 Mercer street, New York City, and are well known. The No. 406 suit case trunk, made especially for automobile use, is illustrated. This carries three suit cases, and is so shaped that it will fit on the trunk rack in the rear of a car, the top portion being cut in for about 10 inches to allow the lower part to go under the overhang of the car body. The doors swing outward like wardrobe doors, and each case is placed on an independent shelf which it fits exactly, so that one may be removed without disturbing the others. It is made throughout of the best materials, and is lined with green felt. It may be had in three lengths, 28, 30 and 32 inches, the width and height being 16 and 24.5 inches.



Ajax Trunk

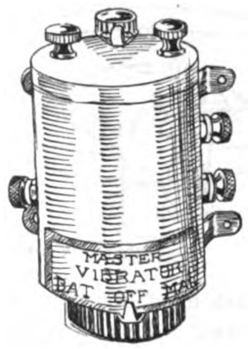
* * *

The Brown Impulse Tire Pump is made by the Brown Company, Syracuse, N. Y., and is a power tire pump operated by the compression of the motor. It may be used either as a permanent fixture on the motor or attached only when it is desired to use it. When fitted permanently, a hole is tapped into the cylinder head in which the pump is screwed, operating horizontally instead of vertically as seen in the illustration, which depicts the temporary installation, with the pump screwed in the spark plug hole. In use, the cylinder to which the pump is attached is cut out from the ignition circuit, the compression of the cylinder being used to operate the piston which forces the air to the tire. Only fresh air is pumped. The outfit consists of the pump, 12 feet of hose and pressure gauge. The pump is made like a motor, with two cast iron piston rings and a connecting rod of high grade steel between the larger piston on which the compression acts and the smaller one which forces the air to the tire. The cylinders are made of gray iron, bored and reamed to exact size.



Brown Tire Pump

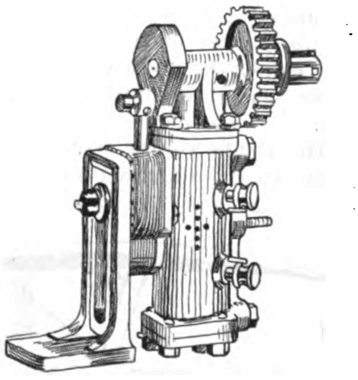
The B. & S. Master Vibrator is made by the Briggs & Stratton Company, Milwaukee, Wis., and was designed with the idea of correcting the timing of a multiple-cylinder motor and increasing its power by substituting one vibrator for three or four. It takes the place of the usual box coil with its several vibrators, each responding to the current at different speeds, held to result in uneven firing. The B. & S. device is small and compact, being 5.25 inches high and 2.5 inches in diameter, and is water and dust proof with an adjustment which is proof against accident or carelessness and yet is sensitive.



B. & S. Master Vibrator

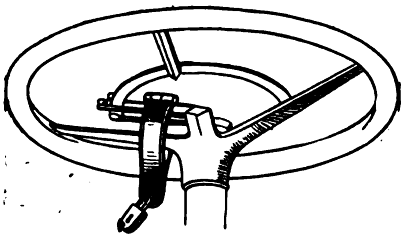
* * *

The Hartford Tire Pump is a double acting single-cylinder pump of great power and capacity. It will pump 1.5 cubic feet of air a minute at a speed of 500 revolutions. That illustrated is designed to be driven from the magneto or pump shaft through a split gear meshing with the gear on pump crankshaft, but one also may be had with a friction wheel, to be driven by contact with the engine flywheel. The gear driven pump is attached to the frame of a car in such position that its gear may be slid in and out of engagement with the gear on the pump shaft. The pump is strongly constructed, the cylinder, pis-



Hartford Tire Pump

ton and piston rings being of cast iron. The piston is of the double type, hollow, and with two valves, one in each head. The pump may be attached where convenient, and is 9.5 inches in height, 3.5 inches in width and 8.5 inches long. It weighs 13 pounds and is tested to 150 pounds pressure. The cylinder bore and stroke are 1.5 inch. The outfit consists of the pump, gears, hose and pressure gauge. To use the gear pump, the motor is stopped, pump gear slid into engagement with gear on magneto shaft and engine started. It is made by the Hartford Pump & Manufacturing Company, 7 Arch street, Boston.


Watch Dog Lock

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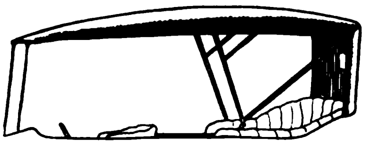
The Watch Dog Lock is one of the newer automobile locking devices on the market, and will no doubt be quite popular. It is simple in construction, consisting of a pair of hinged arms adapted to go around the steering wheel spider and the throttle and spark levers. It is made by S. Breakstone, 1712 Michigan avenue, Chicago, and may be had with or without the padlock, that which is sold with the device being of Corbin make. The advantage of locking the spark and throttle levers lies in the fact that while the car can be moved about the garage, it cannot be run under its own power, so that while protection from thieves is made, the car is not immovable. This is a decided advantage in public garages, where the car must be moved by the employees to make way for other machines, or for washing.

* * *

The Golde Top is made by the Golde Patent Manufacturing Company, Inc., 509 West 56th street, New York City, and contains several new features. As may be seen in the illustration, it has no bow irons for the front seat, there being but a single bow socket on each side. In front of this the top is supported by hinged rods. This construction is such that it may be adjusted nearly as quickly as the old horse buggy top, there being no bows to fit in sockets, etc. No springs are used, and the whole is quite durable. Two styles are offered, one with tapering oval steel rods finished in black enamel, and the other with wooden bows and steel and wrought iron trimmings, the metal being finished in black and the wood in the natural color. The cloth material may be water proof canvas, mohair, or Pantasote.


Golde Top

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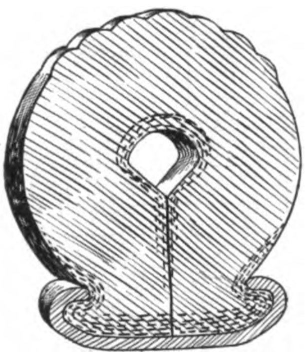
The Cleveland Air Cushion Tire is made by the Cleveland Puncture Proof Tire Company, Columbus, O., and has been designed to derive some resiliency from air, at the same time combining with it the non-puncturing qualities of the solid tire. The construction is seen in the illustration. The tire is solid save for a central air chamber, which communicates with the outer air through a slit in the base, which is lined with friction cloth. The result of this construction is claimed to be that when the tire strikes an obstruction the pressure on the rubber closes the slit and compresses the air, which then lends its resiliency to that of the rubber. This effect is obtained without the use of inner tubes, valves or inflation, so that there is no danger of blowouts, punctures or leaks. The tire is made in standard sizes to fit the standard clincher rims, and is provided at the base with a rubber covered layer of friction cloth to provide against cracking. The tread is beaded to prevent skidding and afford a wearing surface.


Cleveland Tire

* * *

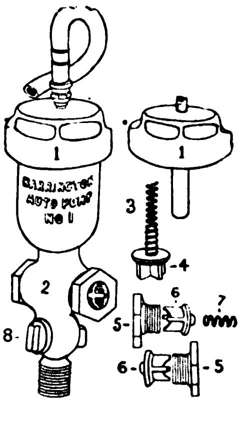
Treadmend is being placed upon the market by the Liberty Rubber Company, Orange, N. J., and consists of a preparation especially made to fill up holes in the tread of a tire and sealing up cuts.

Treadmend

In the care of a casing one of the essentials upon which the tire manufacturers insist most strenuously is the quick attention to small holes and cuts. Through a small hole which might be thought harmless an astonishing quantity of sand will pass, resulting in the familiar sand blister which may remove a considerable section of the tread and need the services of a professional vulcanizer. To prevent such blisters, all holes should be filled up as soon as seen with a preparation like Treadmend.

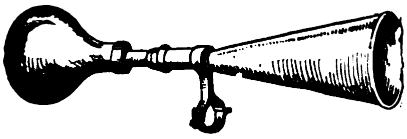
* * *

The Barrington Automatic Pump is made by the Barrington Automatic Automobile Pump Company, Short and South street, Harrisburg, Penn., and is of the compression power variety. The pump is designed to be attached permanently to the engine, being screwed into a hole tapped in the cylinder head. It is only 6.5 inches high, allowing the hood to be closed when not in use. It is simple in construction, with few wearing parts, as may be seen in the illustration. While it may be used as a detachable pump and screwed into a spark plug hole, only when



Barrington Tire Pump

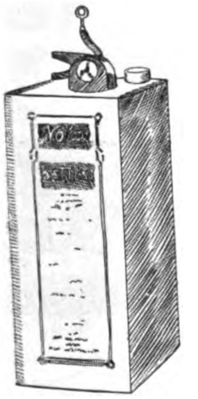
it is desired to use it, trouble may be saved by having the pump attached permanently. In the illustration 1 is the cap forming the top of the compression chamber; 2, the body of the pump; 3 and 4, check valve and spring located in the bottom of the chamber; 5, 6, 7, intake check valves and spring; 8, stop cock to throw the pump out of action when not in use. The pump operates with the engine throttled low as follows: The motor piston on its downward stroke draws air through the two intake valves 5 and 6; the next upstroke of the motor piston forces this air up through the neck of the pump, past the check valve 4 and into the pump compression chamber, from which it goes to the tire.



Vixen Horn

* * *

The Vixen Horn is in external appearance similar to an ordinary bulb horn, but the sound it makes is that of a siren. It is manufactured by the Motor Car Equipment Company, 55 Warren street, New York City. The device is quite unique in combining in a bulb horn the siren quality. Instead of the customary reed there is a small mechanical siren of considerable power which emits the characteristic note which attracts attention even in the traffic roar of a large city. It is stated that the sound is not too loud for city use, and possesses sufficient penetrative ability for use in the country.

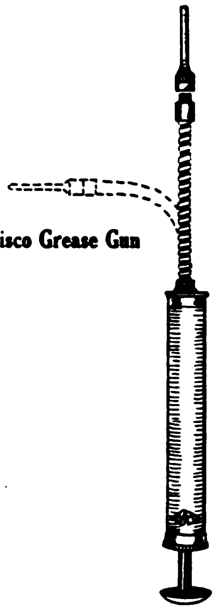


Noloss Battery

The Noloss Battery is an innovation in ignition batteries, being a wet battery in dry battery form, thus possessing the advantages of both. It is made by the Burn-Boston Battery & Manufacturing Works, 9 Doane street, Boston, and consists of a wet battery in a can so sealed that it cannot leak, spill, or appreciably evaporate. It thus combines the long life of the wet battery with the portability of the dry cell. The cell is the same size as the regular dry member, and gives the same voltage and amperage.

* * *

The Wisco Grease Gun is made by the Wilson Instrument & Specialty Company, Passaic, N. J., the No. 5 gun of this company being illustrated. It may be used for either oil or grease and is fitted with a flexible spout which enables the contents to be shot into the most inaccessible places.

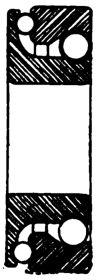


Wisco Grease Gun

The spout may be turned through any angle from zero to 90 degrees, and is provided with a thread to screw into a grease cup, facilitating loading a bearing. The gun will be appreciated by motorists who have tried to load grease or oil into a bearing on a car while on the road, only to have most of the lubricant escape to the ground on account of the awkward position of the gun. The flexible spout enables the contents to be delivered where desired when held in any position.

* * *

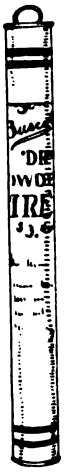
The Globe Ball Bearing is a new type of combined ball radial and thrust bearing, being placed upon the American market by the Globe Ball Bearing Company, 50 Church street, New York City. It is made by the Societe de Mecanique de Precision of Clichy, France. The construction is easily seen in the drawing. There are two ball races, one of which bears the radial load, while the other takes care of the thrust. The bearings will be found of especial advantage in axles, where there is considerable thrust as well as radial load to be taken care of.



Globe Bearing

* * *

The Buscoba Dry Fire Extinguisher is, as its name indicates, a fire extinguisher of the dry powder variety. It is made by the Bush-Scott Company, 31 Woodward avenue, Detroit, and consists of a tin tube filled with a dry chemical which when thrown at the base of a fire generates a gas. This gas does not support combustion, as it does not contain oxygen, and thus puts the fire out. The extinguisher will be appreciated by the motorist, as it is not bulky to carry, being 22 by two inches, and gives effective protection against gasoline and oil fires. As its compactness renders it possible to place it in such a position in the car that it will be instantly available, any blaze can be quenched in its incipiency. One or more may also be kept in the garage convenient for service there should an emergency arise.



Buscoba Extinguisher

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from June Issue.)

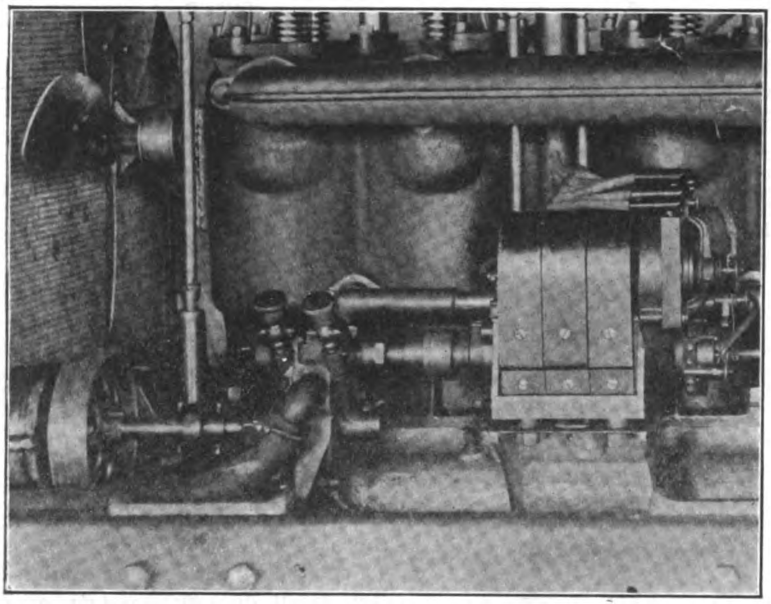


Fig. 44—Magneto Mounting and Peculiar Drive on Pennsylvania Motor.

A very peculiar method of driving the magneto is shown at Fig. 44, which represents the installation on some Pennsylvania models. The magneto is bolted to a cast aluminum bracket formed as a part of the engine base. A gear pump is employed for circulating the water through the cooling system, and as is customary, the gears therein are the same size. The lower gear of the pump is driven at crankshaft speed by a gear meshing with the exhaust camshaft driving member, the magneto armature is turned by a shaft extending from the top pump gear. An Oldham coupling is interposed between the pump gearshaft and armature, this type of joint permitting some slight movement if shafts it joins are not perfectly aligned.

The magneto installation on the Premier six-cylinder engine is shown at Fig. 45. The device is anchored to an extension of the motor base by a cast bronze strap and two bolts as indicated, and is driven by an extension of the centrifugal water pump impeller shaft. The armature and the pump shaft are joined by a flanged coupling which is arranged with a series of holes so spaced that the magneto can be timed with great accuracy. The two flanges are held together by a through bolt.

The Pope-Hartford cars have the magneto installed in a distinctive manner. Instead of the armature being parallel with the crankshaft it is placed at right angles to it, as shown at Fig. 46. This location enables one to reach the distributor and contact breaker very easily, as the magneto is installed just back of the fan. It is held in place against the aluminum platform by a strap having a bolt that is adapted to fit in the slot in the base. Loosening the nut enables one to slip the retaining bolt out of the slot and lift the magneto from its base. The magneto is driven by worm gearing from the same gear that drives the pump and mechanical oiler. An Oldham coupling is interposed between the magneto and the end of the driving shaft. As the gearing is well protected and thoroughly lubricated, there is but little possibility of wear at this important though minor point.

A typical system of magneto driving gears is outlined at Fig. 47, this being the system employed on Knox motors. As will be evident, the camshaft driving gear is at one side of the crankcase and plays no part in turning the magneto armature. The small gear on the engine shaft meshes with a large idler gear, which in turn engages the pinion employed to revolve the armature. The magneto driving pinion and the engine shaft gear are the same size, each having 36 teeth, this tending to turn the magneto at engine speed. The method of holding the magneto in place is similar to that employed on the Premier engine, involving a cast yoke held in place by a pair of bolts provided with winged nuts permitting easy removal if it should become necessary to do this.

The train of gears employed to operate the magneto in the N. S. U. motorcycle power plant is clearly shown at Fig. 48. A small 16-tooth gear is attached to the engine shaft, this meshing with a 32-tooth gear employed to operate the valves. The camshaft gear meshes with an idler gear that serves to drive another gear attached to the armature that is the same size as the camshaft gear. Thus, the magneto and the camshaft turn at the same speed, or half the engine speed. In this view, the case is partly cut away to show the method of installing the gears and the number employed. The magneto is bolted to a small cast bracket or platform attached to the engine case as indicated.

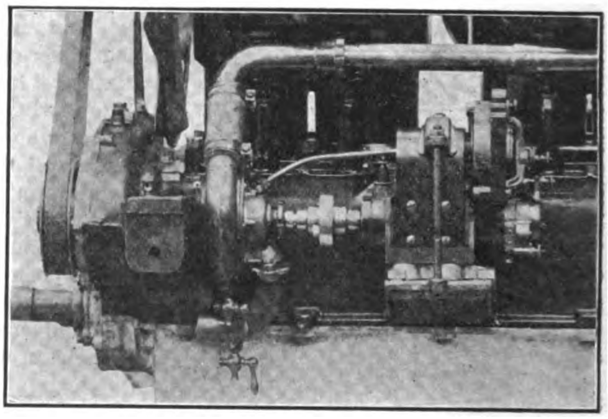


Fig. 45—Attachment of Magneto to Premier Six-Cylinder Power Plant.

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

Magneto Distributor Arrangement.

In fitting magnetos care should be taken to observe the essential precautions necessary to insure correct operation, and the type of engine and number of cylinders will make material difference with the form and manner of application of this device. For instance, when used on three, four, six or eight-cylinder engines it is imperative that they be so coupled that they will be driven in the right direction and at the correct speed, have a properly shaped cam and the proper number of contacts in the distributor.

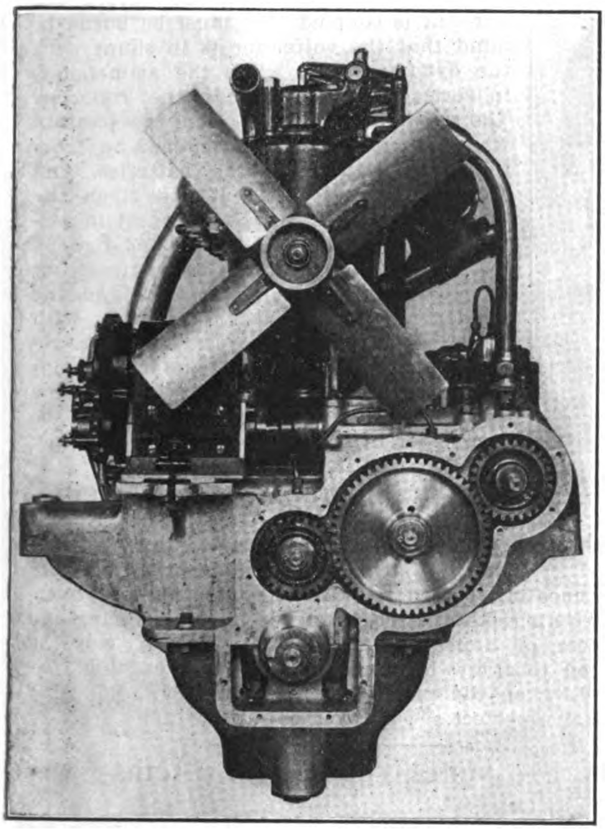


Fig. 46—Unconventional Disposition of Magneto on Pope-Hartford Engine.

At Fig. 49 it will be seen that the important parts of the Simms magneto, which has been previously described, are shown, special attention being called to the distributor design, which is for a four-cylinder motor. The contact breaker is attached directly to the armature and revolves with it at engine speed, the contact points being separated twice each revolution or every time the grounded contact lever toe comes in contact with the fibre rollers attached to the interrupter casing.

Single-Cylinder Type.

A magneto designed for use with a single-cylinder motor does not differ materially from those to be used on other forms, except that the distributor is dispensed with and the secondary winding is coupled directly to the spark plug. The illustration shows the arrangements of the distributors and contact makers of engines designed for fire engines from one to eight cylinders, as well as the speed of rotation compared to the crankshaft, and should prove valuable for reference. When applied to a single-cylinder engine, a single point cam is used, and the appliance is driven at one-half the crankshaft speed if the engine is four-cycle type, and if of the two-cycle type, at crankshaft speed. Obviously, a two point cam would enable one to run the device at the same speed as advised for the four-cycle form. As will be evident, there is but one interruption of the contact for two revolutions of the engine when of the four-cycle type, and an interruption every revolution when the single-cylinder motor is of the two-cycle construction. The direction of rotation is immaterial with this type of machine.

Forms for Two Cylinders.

Various forms of two-cylinder engines are used, the most common being the horizontal opposed type. This form offers no difficulty in installation, and the distributor is fitted with contacts spaced 180 degrees apart, the armature being driven at engine speed, a single point cam being used. The primary circuit is therefore interrupted once each revolution. In event of being used with a two-cycle vertical engine, it should be driven at twice the crankshaft speed, which will result in two sparks each revolution. The form shown at B may be used to advantage when two vertical four-cycle cylinders operate on crankpins which are on the same plane.

When used on two-cylinder vertical four-cycle engines with opposed cranks or with motors of the V type, a special distributor is required and the armature is driven at crankshaft speed. The type of distributor used is shown at C, and it will be noticed that the segments on the distributor are so placed that the order of firing is conversed. When used with a two-cylinder vertical engine, the explosions occur at irregular intervals, there being a spark in one cylinder during the last half of one revolution and in the other the first part of the next, 90 degrees crank travel apart. For this reason the segments are spaced 90 degrees apart, as shown. With a V engine the position is determined by the degree of angle between the cylinders. Two-cycle motors are never built in the V form because there are no advantages to be obtained by this method of placing the two cylinders relative to one another.

Other Forms of Motors.

The use of the magneto on three, four, six or eight-cylinder motors involves no difficulties if they are of conventional forms, the sole precaution being that they are driven at the right speed and in the right direction. A three-cylinder magneto should be driven at three-quarter crankshaft speed, four-cylinder forms at crankshaft speed. When used for six-cylinder ignition, the armature revolves one and one-half times as fast as the shaft, while on an eight-cylinder motor twice the crankshaft speed is necessary. When applied to two-cycle engines, twice the speed advised for four-cycle forms is needed, because there are twice as many explosions a revolution.

The segments on the distributor of a three-cylinder magneto are spaced 120 degrees apart, on a four-cylinder 90 degrees, on a six-cylinder 60 degrees, while the segments of an eight-cylinder distributor are separated by spaces equivalent to 45 degrees. The figures D, E, F and G illustrate this clearly, and show that the contact breaker employs a double cam.

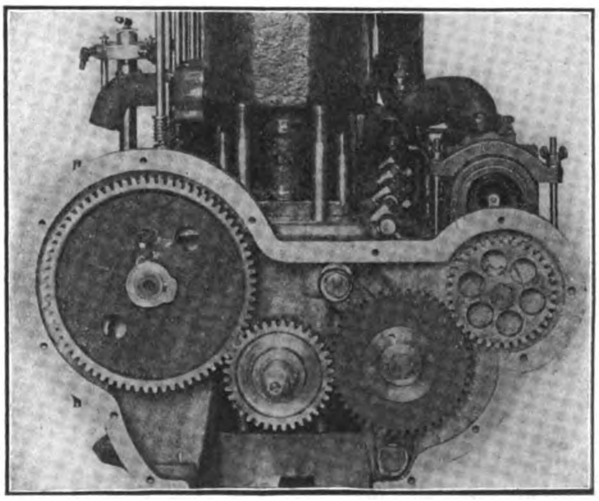


Fig. 47—Typical Method of Driving Magneto.

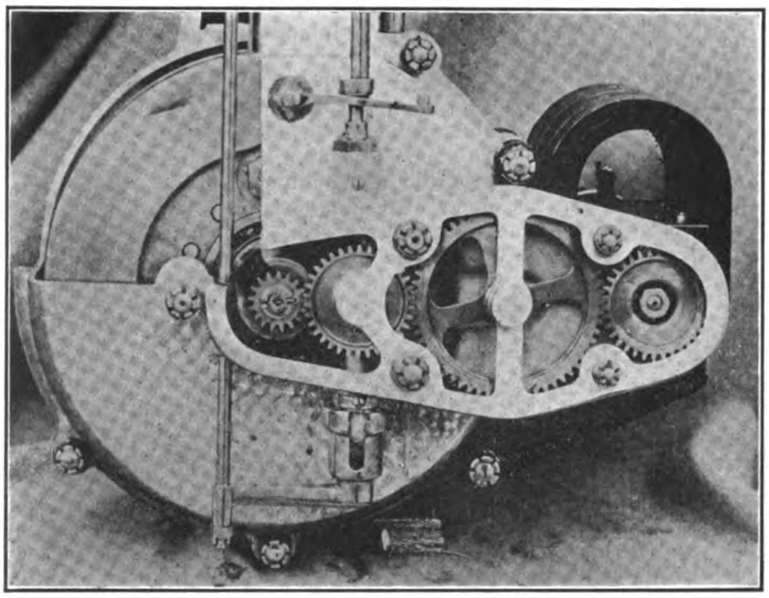


Fig. 48—Train of Gears Used to Drive Magneto on N. S. U. Motorcycle Power Plant.

As these magnetos are to be run in only one direction, it is well to state whether the armature is to run "clockwise" or "counter clockwise" when ordering from the maker. The direction the armature runs is determined by the method of placing, the way the motor turns and the number of gears employed in driving, and will vary in almost every instance.

(To Be Continued.)

CHARGING WITH DYNAMO.

In charging batteries with a compound-wound dynamo, the series coil, or thick wire must not be in use, but only the "shunt" coils; thus the dynamo will be working as a "shunt" machine. It is necessary to find the positive terminal of the generator, and to connect it to the positive of the battery. When four batteries are to be charged they are connected together in series, the positive of one cell to the negative of the next. As every four-volt ignition cell requires a dynamo pressure of five volts, it will be seen that four cells require a like energy of 20 volts, so that the machine must be run at such speed as to give at least 20 volts across the terminals before the last cell is coupled. It must be borne in mind that the voltmeter is in shunt with the dynamo leads, while the ammeter is in series with one lead to the batteries. The ammeter should be noted to ascertain what amount of current is passing from the dynamo through the batteries, and more or less speed should be given the former to get the charging current in amperes required. It is possible to light a few 20-volt lamps at the same time that the batteries are being charged, and the former must be connected in shunt with the dynamo terminals. It should be remembered, however, that by placing lamps in circuit reduces current flowing into the batteries; therefore the dynamo must be run faster in order to supply the demand.

ANNEALING TOOL AND DIE STEEL.

It is an advantage to use annealed tool and die steel, as it obviates the necessity of annealing before roughing, economizes and overcomes all risks of overheating or burning during the process of annealing. After roughing it may be heated to a low heat and left to cool and then finished, when the results in hardening and tempering will give perfect satisfaction.

TO NEUTRALIZE BATTERY ACID.

A certain percentage of sulphuric acid is utilized for the electrolyte of the storage battery, and in handling the device the solution may be spilled upon the clothes or the fittings of the car. To neutralize the effect of the acid there is nothing better than ammonia. When mixed with vaseline it forms a good preventative of corrision when rubbed on terminals.

Oil for Tops—Every car owner should have on hand a can of neatsfoot oil, applying this to his top every two weeks. It keeps the leather soft and pliable.

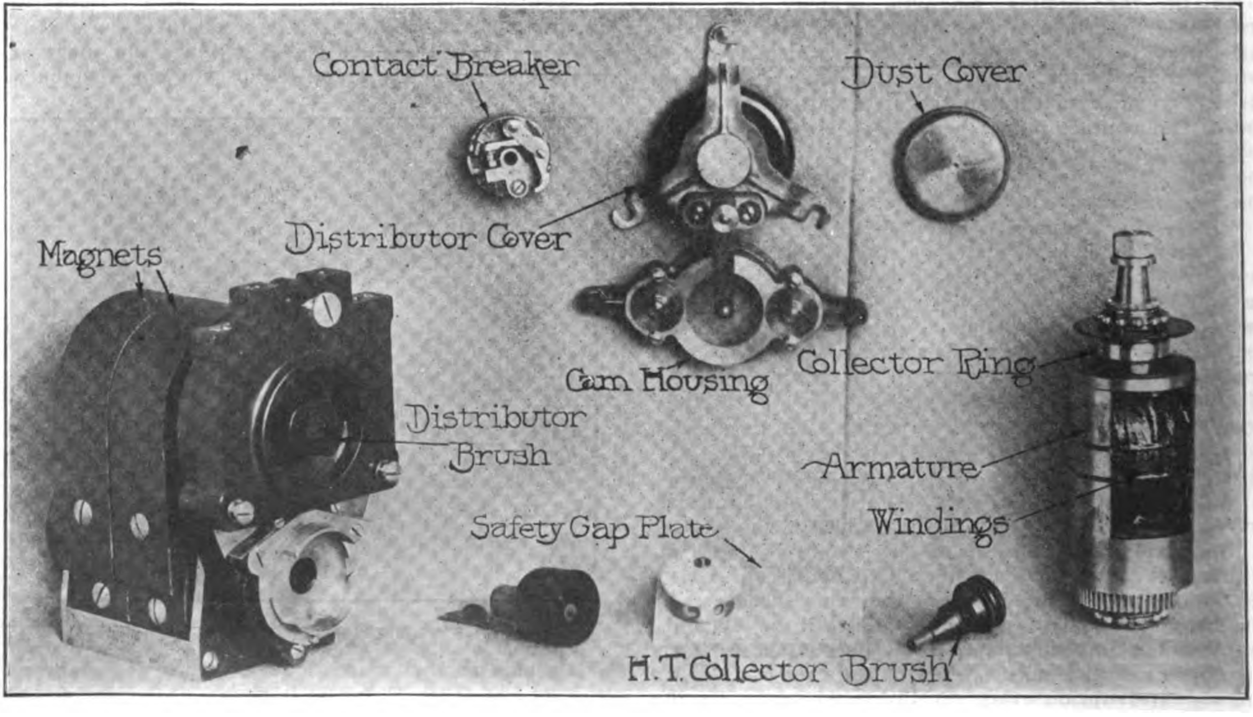
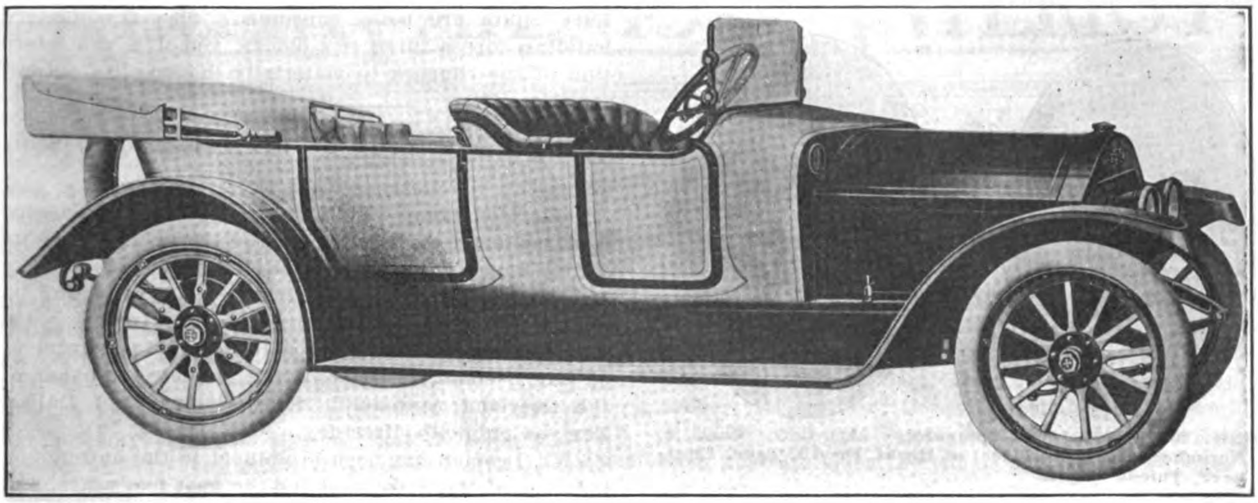
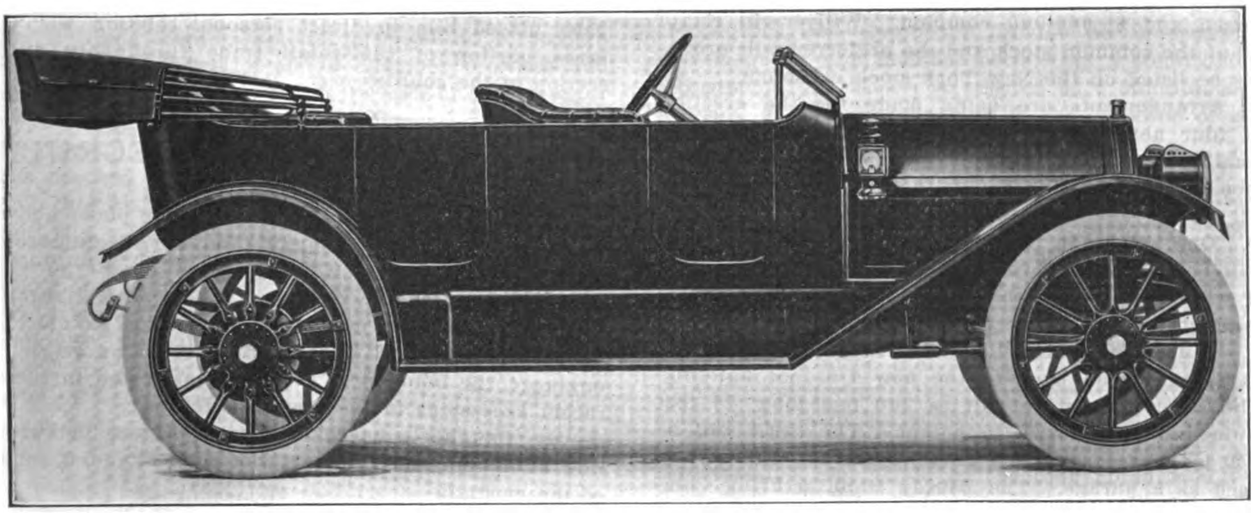


Fig. 49—Important Components of Simms High-Tension Magneto.

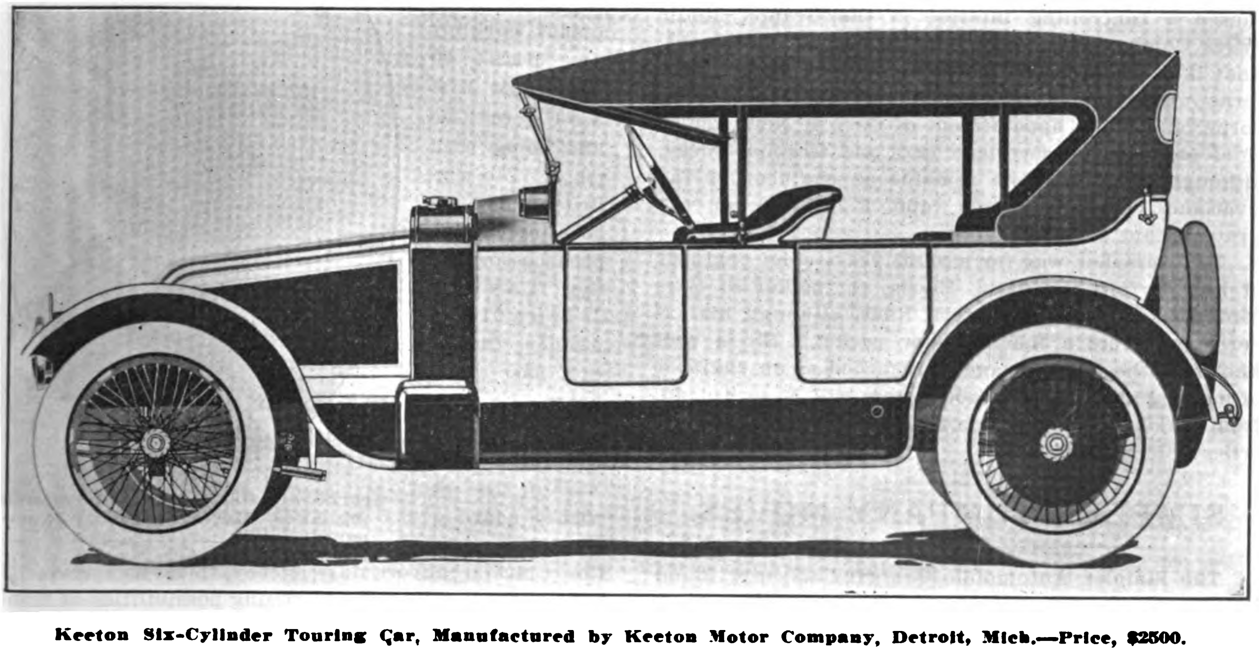
ATTRACTIVE LINES FOR LIVE AGENTS.



Henderson Five-Passenger Touring Car, Model 46, Manufactured by Henderson Motor Car Company, Detroit, Mich.—Price, $1385.



Imperial Model 44 Five-Passenger Touring Car, Manufactured by Imperial Automobile Company, Jackson, Mich.—Price, $1750.



Keeton Six-Cylinder Touring Car, Manufactured by Keeton Motor Company, Detroit, Mich.—Price, $2500.

OVERLAND PLANS EXPANSION.

President John N. Willys of the Willys-Overland Company recently announced plans for increasing the capital stock of his company from $6,000,000 to $15,000,000, and the taking in of his various properties without change of status. When the increase is made, the capital stock will be divided into $10,000,000 preferred and $5,000,000 common. Willys will retain all of the common stock and the preferred will probably be listed on the New York stock exchange.

With Willys-Overland Company: At Left, Carl A. Neracher, Chief Engineer; at Right, Fred I. Tone, Engineer, Toledo Plant.

Arrangements are being made for the erection of four new factory buildings, the improvement of smaller ones and the employment of 3000 additional men. It is planned to double the capacity of the plant. All of the new buildings will be erected in Toledo, O. One will be in the rear of the present plant, and will be 700 by 100 feet and three stories in height. It will extend from the Lake Shore Railway nearly to Derby street. A second will be erected just west of the drop forge department fronting on Derby street, and will extend back to the new 700-foot building. The second structure will be 200 feet long, 70 feet wide and two stories in height. The third will be 130 by 60 feet, fronting on Derby street, and will be used as a garage. The Kinsey Manufacturing Company, one of the Willys concerns, will construct a new five-story building, 300 by 100 feet, on the corner of Derby street and West Central avenue.

It will be remembered that Willys recently purchased a controlling interest in the Gramm Motor Truck Company of Lima, O., maker of Gramm trucks. That it is the intention to operate these various concerns under one general management seems to be borne out by the appointment of Carl A. Neracher as chief engineer for Overland cars and Gramm trucks, although Fred A. Tone remains as engineer of the Overland plant in Toledo, and F. Bisantz of the Gramm plant in Lima.

Mr. Neracher was for several years chief engineer of the Garford Company, Elyria, O., maker of Garford pleasure and commercial lines, although his experience covers a much longer period. He is well known in the industry and is regarded as an engineer of marked ability. His headquarters will be at Toledo, from which point the sales policy of the Willys properties will be conducted.

SIMPLEX COMPANY MOVES.

The Simplex Automobile Company recently found it necessary to remove its entire plant from New York City to New Brunswick, N. J., in order to keep pace with its rapidly growing business. The former factory building on the East river front has been entirely abandoned, but the service station in Long Island City and the retail branch at 59th street and Central Park South are being continued. The new factory building covers three city blocks, and it is the intention of the concern to materially increase its output.

TEXAN WITH HENDERSON.

The Henderson Motor Car Company, Indianapolis, Ind., maker of the new Henderson car, which made its initial appearance during the 500-mile race on the Indianapolis speedway, Memorial Day, is collecting its department heads from widely scattered points. Announcement has just been made of the appointment of Ray Leeman, advertising and publicity manager of the Overland Automobile Sales Company of Dallas, Tex., as publicity director.

Mr. Leeman has been prominent in the automobile industry of the Southwest for the past five years, and is considered an expert on runs, tours, etc. He was for some time manager of the Goodyear Tire & Rubber Company's branches in Houston and San Antonio, Tex., and his association with the Overland Sales Company placed him in direct personal relation with a large portion of the retail trade throughout that section of the country.

ANOTHER MICHIGAN RECRUIT.

As a further evidence of the extensive plans under way by the Michigan Buggy Company, Kalamazoo, Mich., maker of the Michigan car, comes the announcement of the appointment of George H. Daugherty as advertising manager. Following so closely upon the news of W. H. Cameron's selection as chief engineer, the industry is decidedly interested in these recent accessions to the Michigan forces.

Mr. Daugherty has had wide experience in handling automobile accounts, having superintended some of the most signal successes in this field. He has been connected with agency work for the past 10 years, his first work in this line being with the Long-Critchfield Corporation, the predecessor of the Taylor-Critchfield Agency. During the past few years he has been an investigating member of the advisory board of Lord & Thomas, the Chicago advertising agency, and has travelled widely, developing the advertising possibilities of many of the most important accounts handled by that house.

George H. Daugherty, Advertising Manager, Michigan Buggy Company.

RECENT PATENTS of INTEREST

Automatic Fuel Vending Machine.

An automatic gasoline vending machine of the coin-in-the-slot type is the invention of Randolph Shaffer, Albany, Ga., to whom a patent has been issued. The exterior of the fuel container is similar in appearance to that of the usual oil tank and is mounted upon wheels so that it may be moved readily, although means are provided for fastening the device securely. A slot for the insertion of a coin is placed near the top of the vessel and the passage leads to an arm or lever which is connected with another member suitably equipped with a pawl in mesh with a ratchet wheel. The latter is connected with a larger wheel provided with teeth and these are in mesh with a vertical rod which extends downwards to a piston operating in a cylinder in the fuel chamber proper. When a coin is inserted in the slot, the pawl is released and the piston in the chamber descends, forcing a predetermined amount of gasoline through a pipe connected to the piston chamber, upward and out through a suitable nozzle located on the exterior of the vessel. An ingenious arrangement is provided for closing the coin slot when the fuel is exhausted or has reached a certain point. A vertical rod is fitted and this extends upward and into a passage to the coin slot. In conjunction with the rod is a pivotally mounted arm carrying a ball which acts as a float. When the gasoline falls to a predetermined level, the float lever actuates the device in mesh with the toothed rod, and the latter rises, closing the opening into which the coin is inserted, thus preventing loss of the coin as well as signalling that the fuel has become exhausted.

McKee Pneumatic Tire Patch.

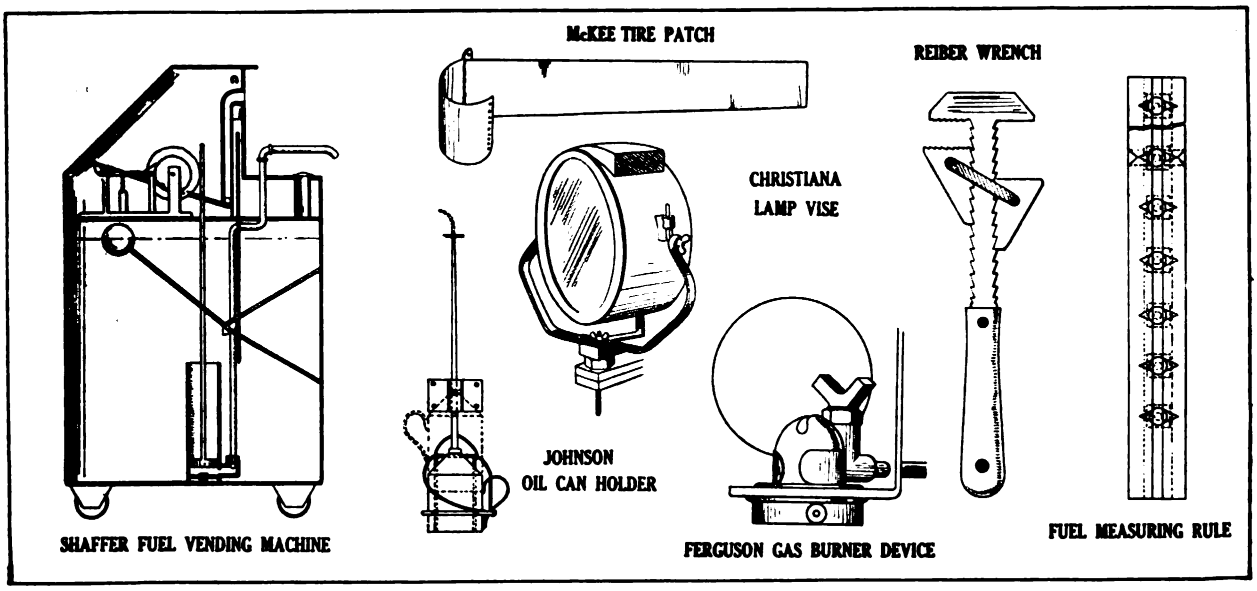
Clarke W. McKee of San Diego, Cal., has been granted a patent for a blow-out patch with which it is claimed that creeping is eliminated. It is constructed of a band of non-elastic material tapered toward one end and of sufficient length to wrap the tire one or more times. The smaller end is tapered while the larger extremity is made of heavier material and provided with a short flap with eye holes for lacing when the device is attached to the shoe. It is claimed that the patch will remain as attached if properly fitted.

Reiber Wrench.

A wrench having adjustable features, also providing means for two different sized openings of the jaws at the same time, has been patented by John Reiber, Huntington, Ore. The shank of the tool is fitted with double stationary jaws, these projecting from opposite sides thereof at one end. The sides of the shank are fitted with a series of teeth, these extending to the handle. A movable jaw on either side of the shank is fitted with teeth corresponding to those on the stationary member and these mesh. The movable jaws are connected by links having pivotal connections and the latter provide an independent movement of each member permitting a step-by-step adjustment. A release is effected by a simultaneous pressure on the movable jaws in the direction of the stationary members.

Gasoline Measuring Rule.

A fuel measuring rule which presents practical features has been patented by Frank M. Edmonds and Russell J. Goodnow, Boston, Edmonds being assignor to Goodnow. It consists of a rod having a number of pointers mounted thereon and these indicators are movable the entire length of the device. Another member is so fitted that it may be slid up or down without interfering with the other indicators. If a fuel tank is to be measured, a gallon or any part of this measure, is poured into the container and the rule inserted, the height of the fluid noted, and the lower indicator set. This operation is continued until the tank is full and the measurements desired obtained. The rule may be calibrated to secure any measurement and the loose sliding member employed to ascertain quantities between the markings.



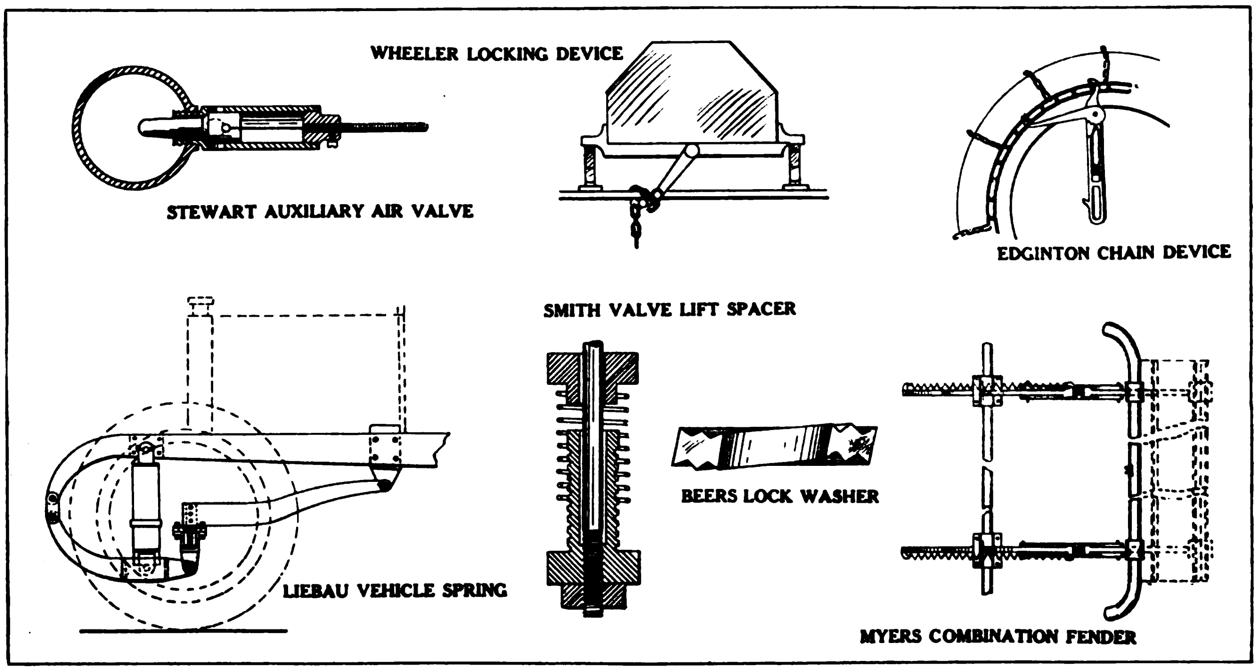
Some Recent Ideas of Inventors Working on Automobile Parts, Accessories and Appliances, Including an Automatic Fuel Vending Machine of the Nickel-in-the-Slot Type.

Christiana Lamp Vise.

A device for holding automobile headlights is the subject of a patent granted to Elmer V. Christiana, Kingston, N. Y. It comprises a base for attachment, and a pair of laterally adjustable oppositely arranged arms mounted upon the base. The lower ends of these members are flat and slotted to fit a bolt or stud having a wing nut for locking the parts securely. An L shaped bracket is also incorporated and held by similar means. The ends of the brackets are provided with means for holding the lamps also wing nuts for clamping the attachment securely.

Ferguson Gas Burner Attachment.

A device for converting oil lamps into acetylene or gas burners has been patented by John Ferguson, New York City. It comprises a spring clip consisting of separable spring jaws to embrace the flame guard of an oil burner. An elbow pipe is fitted securely to the clip, one end of the former being upright and containing means for attaching an acetylene burner. Leading from the elbow is a gas conduit or pipe, this extending through the side of the lamp for means of attaching the tube connecting with the gas container.



Outlining Some of the Ideas of Inventors Working Along Lines Applicable to the Automobile.

Johnson Oil Can Holder.

A patent has been granted Isaac R. Johnson, Milwaukee, Wis., for an oil can holder. It comprises a back brace, part of which is securely fastened to the place of location. To the ends of the rectangular brace is attached a hoop member and a guide rail is incorporated between these parts. A backbone extends from the back brace and the former is fitted with a can nozzle retaining loop, also a bracket for securing the oil can.

Stewart Auxiliary Valve.

A patent has been granted to Alfred C. Stewart, Los Angeles, Cal., for an auxiliary air valve applicable to the intake manifold or pipe of an internal combustion motor. It comprises a cylindrical casing, one end of which is reduced and threaded to fit the manifold. The reduced part has a shoulder forming a seat for a movable valve which seats in a manner similar to a poppet valve. Attached to the valve member is an operating wire enclosed in a flexible housing which leads to any convenient point for service. Near the valve are apertures through which air is drawn when the valve is moved from its seat, and the amount of atmosphere may be regulated.

Wheeler Locking Device.

To prevent the use of the automobile by others than the owner or those intended, Charles A. Wheeler, Bridgeport, Conn., assignor of one-half to the Smith & Egge Manufacturing Company of the same city, has patented a locking device for motor car cranks. It comprises a substantial chain having an elongated socket formed of a series of wire convolutions, one end of the wire being pivotally connected to the chain. The other end is equipped with a padlock. In attaching, the socket is utilized for the handle of the starting crank, the chain wrapped tightly around the cross bar or other suitable place and the padlock secured.

Liebau Vehicle Spring.

A patent for a vehicle spring which presents unusual features, inasmuch as it is designed to combine the function of a spring and shock absorber, has been granted to Richard Liebau, Watervliet, N. Y. Instead of the lower section of the spring being mounted upon the axle it is divided into two sections, that from the body or frame being fastened securely above the axle while the other extremity is pivotally mounted to an extension of the frame. Attached to the goose neck is another spring member, this being secured by a link, while the other end is pivotally mounted and held under the axle. Interposed between the spring and frame is a pneumatic cylinder, also pivotally mounted.

Edgington Chain Tool.

In attaching tire chains, especially worn members, it is sometimes difficult to tighten the chain properly and at the same time snap the retaining hooks into place. William F. Edgington, Springfield, O., assignor of one-half to Alexander Murray of the same city, has invented a chain tightener which consists of two levers, one of which is pivotally mounted and carries a pawl which engages with the smaller member. Both arms are equipped with hooks, these being so constructed as to fit and engage between the links of the outside chain. When the main lever is moved the action brings the hook members together and by means of the ratchet and pawl mechanism the tool is locked, allowing the securing of the locking members of the chain.

Smith Valve Lift Spacer.

Charles W. Smith, Annapolis, Ill., has been granted a patent for a valve lift spacer for internal combustion motors. It comprises a valve mechanism, combining an inlet controlling valve having a stem, and a sleeve mounted upon the latter, and having a screw threaded exterior. Longitudinal grooves intersect the threads, and a valve closing spring and spring lock device are mounted upon the sleeve. The spring is bent into circular form and has a loop at one end and an eye at the other extremity laterally deflected and adapted to interlock with the terminal loop to secure the ends of the wire when brought together. It also has loops or crimps to form a support for the valve closing member and means for contracting the locking device about the sleeve.

Beers Lock Washer.

A patent has been issued to Charles F. Beers of Newark, N. J., for a lock washer which comprises a spirally shaped body having a number of concentric ridges which are triangular in cross section. It is claimed by the inventor that such an arrangement will retain nuts, etc., more securely than those of the spring form.

Myers Bumper and Fender.

Harry T. Myers, Chicago, has been granted a patent for a combined bumper and fender which comprises a two-part bumper and an apron. The upper and lower edges of the latter are attached to the bumper and in a normal position are compactly arranged. Means are provided for opening the apron automatically as well as for separating the parts of the bumper to stretch and hold the apron.

OTHER PATENTS GONE TO ISSUE.

Terminal, William C. Brunt, Boston. A fork shaped spark plug terminal provided with an insulated handle and a set screw to hold secondary wire in said handle.

Steering-Driving Mechanism, Felix A. Eisner, Rochester, N. Y. A driving and steering system in which all four wheels are driven by means of a fluid motor, provision being made in the fluid connections to steering wheel to give differential power effect in turning.

Tire Inflator, Royal L. Foster, Fort Riley, Kan. A rotary pump attached to the axle and wheel spokes, pumping air direct to the tire and to a pressure chamber.

Faucet, Frank M. Ulmer, Philadelphia. A lock faucet for gasoline or other fluids, in which a lock is embodied, the insertion of key in handle being necessary before same can be turned.

Lighter for Gas Burners, Stewart Brown, Chicago, Ill. A spark gap for acetylene burners, in which the sparking wires are held in a base which is movable by means of a thumb screw, enabling it to be adjusted.

Bearing, H. E. Coffin, assignor to the Chalmers Motor Company, Detroit. A bearing for a motor crankshaft, consisting of a disc attached to the shaft between the cranks and bearing on an annular soft metal seat in the crankcase, giving a bearing for each end of each crank and also separating each into a separate gas tight compartment.

Running Gear, David M. Dearing, Jackson, Mich. Automobile running gear in which two members are hinged at the middle, the upper being attached to the frame by the usual elliptic springs, and the lower to the axle. Between the ends of the members are coil springs, so that while the axle may be moved from the horizontal without affecting the elliptic springs, the resistance of the coil springs is met.

Motor, Simon Lake, Milford, Conn. A two-cycle motor in which a chamber is formed in the head, into which gasoline and air is injected to be transformed into a gas by the heat of the chamber and then forced into the combustion chamber by means of air from a pump. The base of the cylinder is also scavenged by a jet of air.

Carburetor, F. H. Walker, Lincoln, Neb. A carburetor for starting motors, in which an inner chamber may be filled with gasoline from which an especially rich mixture can be drawn.

Pneumatic Cushion, F. L. Baker, Orange, Mass. A pneumatic spring, in which the compression chamber is separate from the plunger guides, being between them.

Radiator, J. B. Beam, Punxsutawney, Penn. An automobile cooler in which the radiating sections are removable from the frame.

Lamp, Percy Avery, Milwaukee, Wis. An electric automobile headlight in which the electric bulb may be inserted and removed from the back, without disturbing the glass front. The inner surface of the portion which holds the bulb forms part of the reflecting surface of the lamp.

Rotary Motor, Olof F. Edqvist, Denver, Col. Cylinders are mounted on fixed shaft so that their produced axes do not intersect the axis of rotation. Provision is made to lock pistons against travel and for varying their speed in relation to the cylinders.

Hub Odometer, H. P. C. Browne, New York City. An odometer in combination with the hub cap of a wheel, the cyclometer being operated by means of a plug inserted in a hole in the stationary axle.

Starter, Cornelius Van Tubbergan and Paul Westrate, Grand Rapids, Mich. A starter of the spring type, the spring being attached to a sleeve which may be fitted to the engine shaft by means of a clutch.

Lamp, John H. George, Bridgeport, Conn., assignor to the Hawthorne Manufacturing Company, Inc. An automobile lamp with the reflector held in a holder of sheet metal provided with a threaded projection extending beyond the casing, enabling adjustment of the reflector.

Wrench, George Jurkovitch, Homer City, Penn. The parallel jaws of this both slide upon a frame, to the opposite ends of which handles are attached, so that the jaws are midway between the two handles.

Carburetor, Francis P. Johnson, Oakland, Cal. Is provided with a chamber containing a number of horizontal plates, over which air is forced through the gasoline from the bottom to the top.

MUFFLER NEEDS ATTENTION.

The muffler and exhaust pipe should receive attention if best results from the motor are desired. Cleaning the exhaust pipe is generally easily attended to, but if there should be any trouble owing to bends, the carbon and dirt can be removed by filling the member with small pieces of grit and then shaking well. The muffler itself is best cleaned by placing it in the fire and heating to a fairly bright red. When cool the dirt can be removed easily by tapping or brushing. This does not apply to brass or copper mufflers which should be cleaned by scraping. Sometimes back pressure is caused by too small openings which can be increased. Often these apertures are roughly drilled or punched, with the result that a burr is left on the edges, which considerably impedes the passage of gas by causing eddies at this point.

STARTING ON THE MAGNETO.

Some drivers complain that they cannot start their engine on the magneto although it will respond readily when the battery and coil is utilized. Usually the magneto is blamed, whereas this may not always be the case, but may be due to the carburetor. When some types of motor are being turned over slowly as good a spark is not provided as with the battery and coil, and if the vaporizer be so adjusted as to provide a weak mixture at starting, the flame given out by the magneto is not sufficient to ignite the charge drawn into the cylinder.

This difficulty may be overcome by a readjustment of the mixing device on the low speed, or if no means be provided for this, it is a simple matter to arrange a slide or valve at the end of the main air intake. This may be coupled directly in most cases to a length of .1875-inch steel rod, which can be carried forward in such manner that it may be manipulated from the front of the car. By closing this slide wholly or partially, the mixture will be enriched.

Celluloid Cement—To repair celluloid articles, use three parts alcohol and four parts ether mixed together and applied to the fracture with a brush until the edges become warm. The edges are then stuck together, and left to dry for at least 24 hours.

MEAD NEW AMPLEX HEAD.

An announcement which means much to the industry is that of the retirement of W. J. Mead as vice president and general manager of the Olds Motor Works, Lansing, Mich., maker of the Oldsmobile, to become president and general manager of the reorganized Amplex Motor Car Company, Mishawaka, Ind., maker of Amplex cars. Mr. Mead was also a vice president of the General Motors Company. His place as head of the Oldsmobile establishment has been taken by Oliver C. Hutchinson, the former head of the Marquette Motor Company, Saginaw, Mich., makof Marquette cars.

In the departure of Mr. Mead the General Motors Company loses one of its best known and most capable men. Before his advent in the automobile field, he had made a decided success in the bicycle and sewing machine business. His first motor car experience was with the Jackson Automobile Company, Jackson, Mich., maker of Jackson cars. In 1905 he joined the forces of the Buick Motor Company, Flint, Mich., maker of Buick cars, and for a time was manager of the Chicago salesrooms of that concern. Three years ago he became associated with the Olds Motor Works, and rapidly arose to distinction in the councils of the General Motors Company, acting as its head for a time.

W. J. Mead, President, Amplex Motor Car Company.

Mr. Hutchinson is well known in automobile circles. Under his management the Marquette, the newest production of the General Motors Company, first placed on the market for the 1912 season, has achieved a remarkable success. In this connection, it may be stated that plans are under way which involve the production of an entirely new model for 1913, and the work of Mr. Hutchinson will be carried on by a new manager, whose name the concern does not feel at liberty to divulge at present.

Respecting the Amplex plans, it is stated that under Mr. Mead's direction the factory will be enlarged and brought up-to-date in every particular. It is understood that the sales end will be entirely separate, and that offices will be located in Chicago, probably on Michigan avenue. Special attention will be paid to the matter of the service department, through which owners of Amplex cars will be accorded most efficient co-operation.

MORGAN WITH MARION.

Matthew B. Morgan, one of the best known automobile engineers in the country, has joined the James I. Handley forces as chief engineer of the Marion Motor Car Company. The selection of Mr. Morgan by President Handley provided one of the big surprises of recent date in automobile circles.

Mr. Morgan was chief engineer of the Chalmers Motor Company, Detroit, the past three years, producing the 1910, 1911 and 1912 models. Three years previous to associating himself with the Chalmers interests, Mr. Morgan was with the Olds Motor Works, Lansing, Mich., maker of the Oldsmobile. He first acted as assistant engineer, but was made engineer to take the place of Chief Engineer Dunham when the latter went to the Hudson Motor Car Company. The Oldsmobile six-cylinder is well known as one of his creations.

Before going to the Oldsmobile concern he was with the Packard Motor Car Company, Detroit, and with the Peerless Motor Car Company, Cleveland, O. In the Peerless factory he had work as special assistant to Chief Engineer L. P. Moore. Mr. Morgan says that he can base his fame on having designed the first racing car for Barney Oldfield, the famous "Green Dragon."

TO ESTABLISH BRANCHES.

Howard E. Wagner, until recently sales manager of Wyckoff, Church & Partridge, Inc., New York City, has assumed his duties in the same capacity with the Buffalo Electric Company, Buffalo, N. Y. He will make his headquarters in Buffalo, and will take charge of the work of establishing branch houses in a number of cities throughout the country.

Mr. Wagner's association with the automobile industry dates from 1904, when he had charge of the selling of Pope Waverley electrics at Indianapolis, Ind. From 1906 to 1908 he managed the selling department for Babcock electric carriages for Wyckoff, Church & Partridge in New York, and in the latter year became branch manager for the Babcock Electric Carriage Company in that city.

The Buffalo Electric Company was organized recently with capital of $1,000,000, being a consolidation of various electrical concerns in Buffalo, including the maker of the Babcock electric vehicles. The reorganized firm also will enter the field with electrically driven baggage trucks and commercial vehicles. Branch houses already have been established in Rochester, Buffalo, Chicago and Cleveland, and others undoubtedly will follow in all principal cities.

Howard E. Wagner, Sales Manager, Buffalo Electric Company.

NATIONAL SHOW CIRCUIT.

The National Association of Automobile Manufacturers at a recent meeting in New York City arranged a 12-city circuit for shows during the coming year, the determination for such a plan being announced immediately after a session of the executive committee, and show managers in 12 of the largest cities of the country will assist in promulgating the new idea. Chester I. Campbell, manager of the Boston show, was chairman of the committee appointed to arrange the national dates, as follows:

Cleveland, Jan. 4-11; New York, Jan. 11-18; Philadelphia, Jan. 20-25; Detroit, Jan. 27-Feb. 1; Chicago, Feb. 1-8; Minneapolis, Feb. 10-15; Kansas City, Feb. 17-22; St. Louis, Feb. 24-March 1; Pittsburg, March 3-8; Boston, March 8-15; Buffalo, March 17-22; Indianapolis, March 24-29.

The plan was not adopted until after a lengthy discussion, those present at the meeting finally deciding unanimously that it would result advantageously to both manufacturer and show promoter.

The subject of special trains for the conveyance of exhibits and employees, co-operative advertising and uniform rules also was considered, and a committee was appointed to confer with the Motor and Accessory Manufacturers in an endeavor to procure its co-operation and sanction of the circuit.

It is possible that the summer of 1913 will see a commercial vehicle exhibition and demonstration conducted by the N. A. A. M., which may or may not take the place of the winter shows as now held, this being a subject for which the opinion of the trade will be canvassed. The matter has been referred to the show and commercial vehicle committees.

Other business transacted included the admission to membership of the Auburn Automobile Company, Auburn, Ind., represented by J. I. Farley and the Ideal Motor Car Company, Indianapolis, Ind., represented by E. G. Sourbier. H. R. Bradford was elected to succeed R. A. Palmer as representative of the Cartercar Company, Pontiac, Mich., and H. W. Taylor to succeed B. A. Becker of the Elmore Manufacturing Company, Clyde, O. The membership formerly held by W. J. Groves, representing the Mack Bros. Motor Car Company, was transferred to C. P. Coleman, representing the International Motor Company, New York City, of which the Mack concern is now a constituent.

Show managers present were: Louis Block, Philadelphia Automobile Trade Association; T. I. Cochran, Pittsburg Automobile Show Association; A. E. Doherty, Automobile Show Association of Pittsburg; F. W. Paynes, St. Louis Automobile Dealers' Association; H. E. Pence, Minneapolis Automobile Show Associa- Association; F. H. Calet, F. C. Wood, Cleveland tion; W. F. V. Neumann, Detroit Automobile Dealers' Automobile Show Company; Chester I. Campbell, Boston Automobile Dealers' Association; H. L. Archey, Indianapolis Automobile Trade Association; A. L. Pope and S. A. Miles of the N. A. A. M. show committee.

TO SELL O. N. L. Y. CAR.

A meeting of the stockholders and directors of the Southern Only Motor Car Company of Delaware, was recently held at the offices, 209-11 Bisbee building, Jacksonville, Fla. This company is the distributor for the O. N. L. Y. car, which was to make its appearance this month. The new car is equipped with a 90 horsepower motor, which, the manufacturer claims, will run 30 miles on a gallon of gasoline. The company is also distributor for the Dayton airless tires and other new accessories.

BENSON WITH STUDEBAKER

Ernest R. Benson recently was appointed sales manager of the Studebaker Corporation, Detroit, after having been connected with the Cadillac Motor Car Company in the same capacity for five years, and the move has attracted considerable attention in automobile circles. He is numbered by those who are qualified to know, as one of the pioneers in placing automobile selling on a firm basis, where the prices and service of high grade cars are as well established as in other lines of successful business endeavor.

E. R. Benson, Sales Manager, Studebaker Corporation.

Mr. Benson has earned the name of business builder, having a reputation for creating a solid and permanent volume of sales, and of securing the confidence of the manufacturer, dealer and customer. During his experience he has been a sales organizer, engaged with dealers in managing selling arrangements. His first connection was with the Pope Manufacturing Company, Hartford, Conn., with which concern he was associated for 12 years, as a member of the sales organization. He then joined the sporting goods house of A. G. Spaulding & Bro., working in the sales department for four years. Returning to Hartford, he became secretary of the Hartford Rubber Works Company in charge of the New England sales.

It was from this office that he went to the Cadillac as manager of sales. In this he succeeded in building up the business along well founded principles, creating a permanent and loyal body of dealers. This quality of developing a loyal force of dealers coupled with his ability to sense the future of the markets and lay plans accordingly makes Mr. Benson a valuable acquisition to the Studebaker organization.

REPUBLIC TIRES IN CLEVELAND.

To care for its rapidly growing trade in the district, the Republic Rubber Company of Youngstown, O., maker of Republic tires, recently opened a factory branch at 5919 Euclid avenue, Cleveland. The new branch is to be in charge of B. C. Swinehart, who has been situated at the factory for the past 2.5 years, where he has charge of the solid tire department, and who will continue this work in addition to his new duties. He has been closely associated with the rubber business for the past 12 years.

Members of the Society of Automobile Engineers, Their Wives and Children, in Attendance upon the Annual

THE HAYNES HOUSE PARTY.

The first annual house party of the Haynes Automobile Company, maker of Haynes cars, was held at the new factory of this concern in Kokomo, Ind., late last month. More than 300 invitations had been issued to Haynes agents and dealers, and others connected with the industry, and over 200 were registered when the proceedings were called to order by General Manager Warren. The first business of the convention, if such it may be termed, was the presentation of 50 certificates, good as gold in any store in town, to each of the visitors. The object was to make it unnecessary for the guests to spend a cent during their stay in Kokomo.

Among those present were the following:

Edward Anderson, Diamond Rubber Company, Chicago; Miss Armstrong, New Albany, Ind.; J. L. Ashbaugh, Indianapolis.

H. G. Bosler, Indianapolis; Edward A. and Omar L. Banschbach, Haynes Automobile Company, Chicago; J. H. Bridger, Colorado Springs, Col.; J. T. Bishop, Cleveland, O.; Walter A. Bermingham, Chicago; T. J. Butler, Harrison, N. J.; Orville Barnett, Maroa, Ill.; Peter Beyrent, Scranton, Penn.; B. W. Baxter, Haynes Automobile Company, Indianapolis; George Brown, Indianapolis; C. C. Blodget, New York City; R. N. Brady, National Acme Manufacturing Company, Cleveland, O.; C. G. Beck, Portland, Ind.; C. S. Beck, Marion, Ind.; V. Bendix, Kokomo, Ind.; T. W. Brotherton, Jr., Haynes Auto Sales Company, Los Angeles, Cal.; E. L. and E. M. Brown, Marshall Auto and Machine Company, Marshall, Mo.; H. R. Baurmann, Chicago; F. M. Blessing, Mueller Implement & Auto Company, Delphos, Ind.

Mrs. H. D. Chapin, Muncie, Ind.; W. J. Caughy, Farmer Auto Company, St. Joseph, Mo.; B. Cooley, Galena Auto Company, Galena, Kan.; F. R. and C. R. Carson, F. R. Carson & Son, South Bend, Ind.; L. S. Conarroe, Goodnight & Conarroe, Kempton, Ind.; G. and D. Cordell, Hagerstown, Ind.; R. N. Crawford, Chicago; Mr. and Mrs. W. B. Cochran, Haynes Auto Sales Company, San Francisco, Cal.; St. Clair Couzens, Chicago; Charles A. Chevraux, Cleveland-Canton Spring Company, Canton, O.; H. D. Chapel, Haynes-Automobile Company, Chicago; C. C. Cartwright, Portland, Ind.; Mr. Courd, Hagerstown, Ind.

James M. Dunlap, Dunlap-Ward Advertising Company, Chicago; Mr. Deb, Hagerstown, Ind.; O. M. Dale, O. M. Dale Company, Franklin, Penn.; D. L. Dider, Haynes Automobile Company, Kansas City, Kan.; Thomas Diager and E. H. Diohy, Haynes Automobile Company, Chicago; Mr. and Mrs. Charles E. Davis, Warner Gear Company, Muncie, Ind.; Charles C. Dodge, Wyman & Gordon Company, Worcester, Mass.; Paul Doran, Santa Fe, N. M.; E. J. Disher, Buffalo, N. Y.; Edward A. Dauer, Providence, R. I.

C. O. Eal and Mr. Ensley, Hagerstown, Ind.; R. H. Eckenroth, Eckenroth Sales Company, Cleveland, O.

J. H. Ferryman, South Bend, Ind.; R. V. Faulkner, Haynes Automobile Company, Indianapolis; H. W. Faurer, Diamond Rubber Company, Indianapolis; A. B. Fairchild, Chicago; A. R. Fernald, Mathews, Kaye, Mann & Co., Detroit; R. R. Ferguson, Haynes Automobile Company, Philadelphia.

C. G. Gray, Reimers Motor Car Company, Louisville, Ky.; Mr. Green and Mr. Grove, Hagerstown, Ind.; C. E. Gordon, Timken products, Detroit; E. E. Grady, Chicago; F. C. Gilbert, Timken-Detroit Axle Company, Detroit; F. W. Graessle, Stilz & Graessle, Nashville, Tenn.; L. Mac Goodwin, Raleigh Motor Car Company, Raleigh, N. C.; F. A. Gibson, Northwestern Garage, Kansas City, Kan.; C. H. Gurnett, Chicago; A. H. Gunder, Fairmount, Ill.; B. E. Griffey, B. E. Griffey Company, Indianapolis; T. E. Goodnight, Goodnight & Conarroe, Kempton, Ind.

G. Hoyt, Tri-State Supply Company, White Plains, N. Y.; C. H. Haynes, Dallas, Tex.; M. C. Hann, Haynes Automobile Company, Chicago; W. M. Haynes, Portland, Ind.; Mr. Hawkins, Hagerstown, Ind; Robert E. Hosea, McCullough Motor Supply Company, Indianapolis; D. L. Hogen, Konkakee, Ill.; Frank Horn, Haynes Automobile Company, Santa Fe, N. M.; Frank G. Hood, Haynes Auto Sales Company, San Francisco; R. L. and G. M. Haughey, Sheridan, Ind.; E. G. Hunter, McCord Manufacturing Company, Detroit; E. W. Headington, Haynes Automobile Company, New York City; F. C. Headington, Haynes Automobile Company, Indianapolis.

A. J. Interreiden, Warner Instrument Company, New York City.

HAYNES
HOUSE PARTY

Guests of the Haynes Automobile Company Assembled at Kokomo, Ind., for the First House Party of

Midsummer Convention, Soon After the Arrival of the Good Ship City of Detroit II at Mackinac Island.

A. H. Jones, Hastings, Neb.; H. L. Jones, Chicago; Mr. and Mrs. M. W. Jennings, Hellman Motor Car Company, Cincinnati, O.; C. T. Jay, C. T. J. Motor Company, New Orleans, La.; James H. Johnson, Johnson Motor Car Company, Philadelphia; C. E. Jordan, Springfield, O.; Miss Jennings, Chicago; W. T. Jay, New Orleans, La.

R. Kelley, Jr., Kelley Auto Company, Youngstown, O.; S. L. Krebs, Swarthmore, Penn.; W. C. Knight, Warner Instrument Company, Indianapolis; J. L. Keeling, Campbell & Keeling, Joliet, Ill.; A. A. King, Chicago.

Mr. Lamb, Hagerstown, Ind.; Percy Leach, South Bend, Ind.; N. C. Lipsitz, Muncie Foundry & Machine Company, Muncie, Ind.; Fred Lehman, Canton, O.; B. M. Leece, Leece-Neville Company, Cleveland, O.; J. A. Long, Portland Body Works, Portland, Ind.

L. L. Magruder, Augusta Machine Company, Augusta, Ga.; C. L. Magruder, Haynes Automobile Company, Danville, Ill.; James S. Marlow, Holcomb Steel Company, Indianapolis; Mr. and Mrs. Lester McCullough, McCullough Motor Supply Company, Indianapolis; Lee W. Maxwell, Chicago; Mr. Murray and Mr. Morris, Hagerstown, Ind.; W. J. Morgan, American Automobile Association, New York City; W. S. McHaffey, Haynes Automobile Company, Chicago.

Fritz Neef, Eisemann Magneto Company, New York City; S. M. Neville, Leece-Neville Company, Cleveland, O.; S. R. Nowlin, Maroa, Ill.; R. J. Nightingale, Willard Storage Battery Company, Cleveland, O.

Frank A. Osburn, Timken products, Detroit; Edgar Oliver, Muncie, Ind.; L. F. O'Donnell, Haynes Automobile Company, Jacksonville, Ill.

John P. and James G. Parker, Maroa, Ill.; H. M. Paine, Paine Automobile Company, St. Louis, Mo.; H. A. Paxton, Paxton's Garage, Bucyrus, O.; H. W. Paton, Detroit Carriage Company, Detroit; E. P. Poyer, Chicago; Edward Politz and G. E. Porter, Haynes Automobile Company, Chicago; Mr. Paul, Hagerstown, Ind.

J. F. Ross, Louisville, Ky.; H. Harvey Roemer, Catalogue Service Corporation, Indianapolis; Joseph D. Rourk, Brooklyn, N. Y.; Carl G. Reimers, Reimers Motor Car Company, Louisville, Ky.; Mr. Rowe, Hagerstown, Ind.; W. L. Russell, W. L. Russell Company, Boston; W. H. Reed, Portland, Ind.; F. A. Ross, Warner Instrument Company, Beloit, Wis.; Paul Morse Richards, New York City.

O. P. Stehn, Hydraulic Pressed Steel Company, Cleveland, O.; George H. Smith, Portland, Ind.; B. S. Snell, Stilz & Graessle, Nashville, Tenn.; C. R. Schuyler, Haynes Automobile Company, Newark, N. J.; Lewis C. Smith, Portland Body Works, Portland, Ind.; J. O. Stone, Stone's Alarm Device, Tipton, Ind.; Charles W. Stone, Tipton, Ind.; L. A. Safford, Chicago; Mr. Starr, Hagerstown, Ind.; T. H. Shiff, Paine Automobile Company, St. Louis, Mo.; Zi See and Chi Tin Sun, Lafayette, Ind.

T. L. Tincher, Haynes Automobile Company, Santa Fe, N. M.; R. C. Thomas, Calgary, Alta., Canada; C. N. Teeter, Light Inspection Car Company, Hagerstown, Ind.; Neil Thomas, Kokomo, Ind.; Lother, M. I. and B. Teeter, Hagertown, Ind.; H. A. Townsley, Haynes Automobile Company, Akron, O.

D. P. Vanmeter, Marshall Auto & Machine Company, Marshall, Mo.

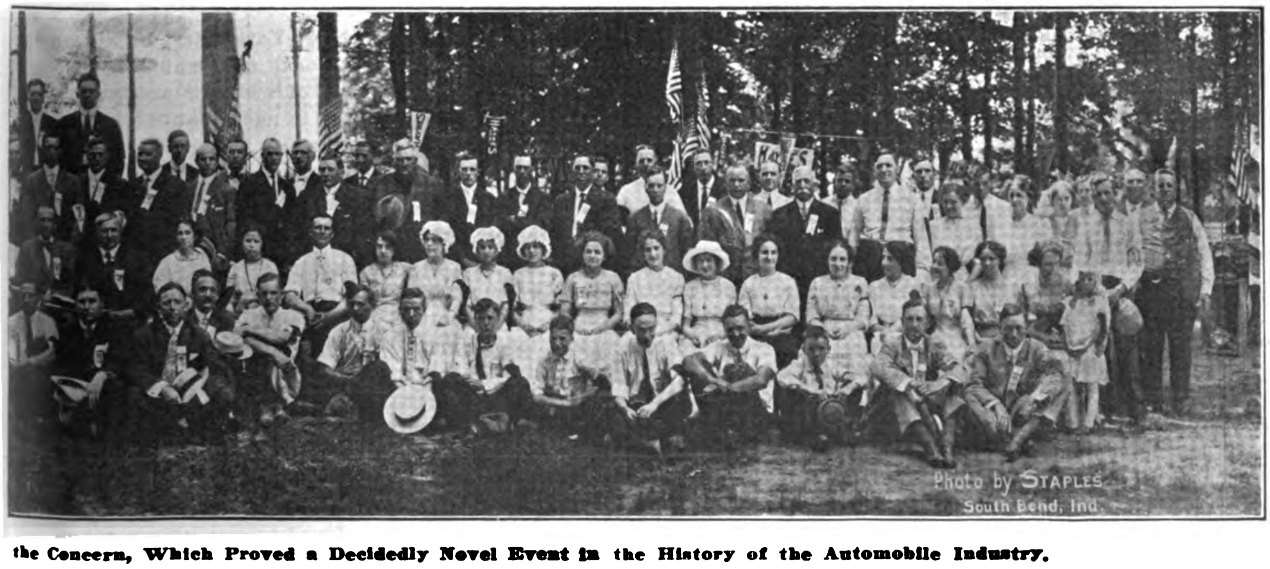
E. G. Westlake, Chicago; E. W. Werick, Werick Bros. Motor Car Company, Buffalo, N. Y.; C. D. Wright, New York City; Evander Williams, Evander Williams & Co., Memphis, Tenn.; J. E. Williams, Chicago.

Lloyd Yount, Yount & Ewry, Portland, Ind.

A. M. Zimbrich, Rochester, N. Y.; E. C. Zaring, Haynes Automobile Company, Indianapolis.

ENGINEERS' MIDSUMMER MEETING.

The annual midsummer meeting of the Society of Automobile Engineers was held in Detroit, June 27-29. That is to say, Detroit was the rendezvous of something over 250 members, their wives and children, aside from those who reside in that city and vicinity, while the meetings to listen to reports of officers and committees and to discuss the interesting papers presented, were held on board the steamer City of Detroit II en route to Mackinac and return. Incidentally, the selection of Mackinac island proved wise, inasmuch as automobiles are rigorously excluded from the domains and the engineers had ample opportunity to forget their usual vocations entirely.



the Concern, Which Proved a Decidedly Novel Event in the History of the Automobile Industry.

TRUFFAULT-HARTFORDS IN RACING.

Special attention is being paid to the matter of accessories fitted to cars taking part in the important racing events this year, and it is of particular interest to note that Truffault-Hartford shock absorbers, made by the Hartford Suspension Company, Jersey City, N. J., were employed on all of the first nine prize winners in the recent 500-mile race on the Indianapolis motor speedway. Dawson's National, which won the first prize, utilized a double set of these shock absorbers, and it is stated that they aided materially in making it possible to maintain an average speed of 78.72 miles an hour. In accordance with its announcement the Hartford Suspension Company has paid the following special prizes as the result of the work done by Truffault-Hartford equipped cars in this event: First, Dawson, National, $250; second, Tetzlaff, Fiat, $150; third, Hughes, Mercer, $100.

MARMON COMPANY EXPANDS.

In order that it may be able to increase its output to meet the demand created for Marmon cars, the Nordyke & Marmon Company, Indianapolis, Ind., has made arrangements for substantial additions to its plant. A new office building is to be erected, this being a two-story brick structure, 43 by 155 feet. The general and executive offices will be located on the first floor, and the enlarged drafting rooms on the second. Two stories, 52 by 243 feet, also will be added to one of the factory buildings.

CATARACT TIRE GUARANTEE.

The Cataract Rubber Company, Buffalo, N. Y., which was organized about a year ago, is placing in the market a guaranteed tire, in the production of which a liberal use of the finest Para rubber and selected Sea Island cotton plays a prominent part. The maker has given the Cataract tire every test, and it has been abundantly indicated that the consumer is certain of securing a service of 6000 to 8000 miles. Branch offices have been established in a number of cities, included among which are Boston, Mass., and Providence, R. I. The officers are: President, William J. Bullock; first vice president, Samuel J. Greene; second vice president, George N. Steere; treasurer, Francis M. Adams; secretary, Edwin P. Dodge. The concern is capitalized for $500,000. The manager of the Boston branch, which is located at 1002 Boylston street, is I. C. Emery.

R-C-H IN DEMAND ABROAD.

Since the first R-C-H car was shipped from the factory of the R-C-H Corporation, Detroit, a little over six months ago, it has achieved considerable popularity abroad. At present dealers are handling it in 28 different countries, with hundreds of cars in operation. This representation is not confined to any one section of the globe, for the cars are to be seen on every continent and in all the principal countries. All the cars are shipped complete, with the regular bodies, in contrast to much of the export trade in automobiles, which is in the chassis alone, the bodies being built abroad according to foreign ideas.

NEW BARRETT JACK FACTORY.

Five acres of ground on Preble avenue, Northside, Pittsburg, Penn., on the lines of the Pennsylvania and Baltimore & Ohio railroads, have been purchased by the Duff Manufacturing Company of Pittsburg, exclusive maker of Barrett lifting jacks. Work is to be started at once on the erection of a new factory building, which, when completed, will be the largest in the world devoted exclusively to the manufacture of lifting jacks. The new site, and that of the Pittsburg Screw & Bolt Company occupy the Riter Conley Company's property and that adjacent thereto, totalling about 12 acres. The Duff Manufacturing Company's products comprise the largest line of lifting jacks in the world, ranging in capacity from 1000 pounds to those capable of lifting 500 tons and over.

VULCAN PLANT IN CANADA.

When the first spade of dirt was turned, preparatory to building a new factory in Wetaskiwin, Alberta, Can., for the Vulcan Automobile Company, work was started that will make automobile history, not only in Canada, but possibly in this country. It is the plan of the officers of the new company to manufacture an all-Canadian automobile as soon as operations can be commenced after the completion of the plant. Work is being pushed forward as rapidly as possible on the new structure, and it is understood that the firm plans to begin manufacturing this fall. Announcement concerning the style of cars to be made and other information is expected to be forthcoming at an early date.

DEATH OF A. W. HARRIS.

The industry will be deeply grieved to learn of the death of A. Walter Harris, head of the A. W. Harris Oil Company, Providence, R. I., in that city, June 30. Mr. Harris may be regarded as one of the pioneer oil men of the industry; in fact, the A. W. Harris Oil Company was organized some 28 years ago and was engaged in the production of cylinder oils for steam engines and other purposes long before the practicability of the automobile was considered as established. It may be added that the business of the concern will be continued as in the past, Mr. Harris' associates assuming the burdens laid down by him.

NEW TIRE MADE IN SECTIONS.

Jacques Bustanoby of New York City has been granted a patent for a motor car tire which is constructed in four sections, each of which is a complete air chamber and bolted to rim in such manner that it may be removed without disturbing the others, in the event of a puncture or a blowout.

DIAMONDS IN MOTOR CAR INDUSTRY.

It is not generally known that diamonds are utilized in the manufacture of automobiles, but the gems are so employed for the purpose of truing emery and other abrasive wheels used in grinding, a process that plays an important part in motor car construction. Parts that were formerly filed or machined in different ways, are now finished by being ground with emery wheels revolving at a high rate of speed. These must be kept true, and like any other cutting tool are so hard that diamonds are employed to smooth up rough and uneven places.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, etc.:

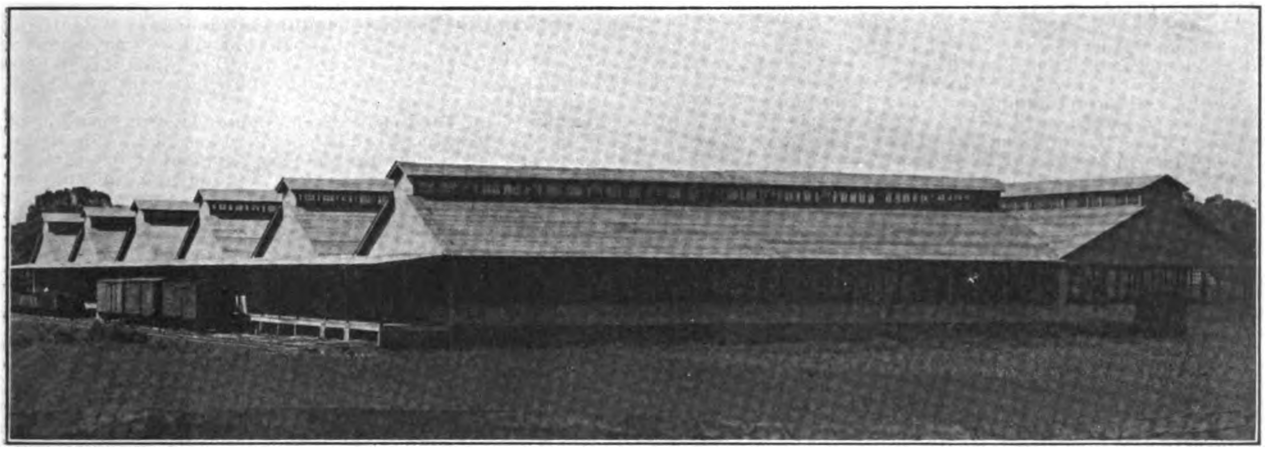
Hexolene Lubricating Company, Inc., New York City; $6250; to manufacture lubricants for automobiles and other machinery; incorporators, Fred Lesser, Norman Ehrenthal, Herman Block.

The Henry Engineering Company, New York City; $20,000; to design and manufacture parts for motors, automobiles, etc.; incorporators, George L. Henry, Henry W. Badenhausen, Myron F. Hill.

White Automobile Company, Indianapolis, Ind.; $2000; to deal in automobiles; incorporators, R. D. Eagelfield, J. H. Darling, G. W. Fuller.

Paris Auto Transfer Company, Nashville, Tenn.; $2500; incorporators, F. L. Hensler, M. H. Gholston, F. P. Johnson, J. H. Cooper and J. M. Shackleford.

Auburn Wheel and Manufacturing Company, Auburn, R. I.; $60,000; to manufacture automobile wheels and other parts; incorporators, George Wilkinson, Fred Edgeworth, Bernard T. Egan.



Factory of the Penn Motor Car Company at New Castle, Penn., with Main Building, 510 by 60 Feet, and Six Wings, Each 150 by 60 Feet.

Sacramento Co-Operative Company, Sacramento, Cal.; $200,000; incorporators, T. J. O'Kelly, T. J. Benson, J. W. Shanks, T. R. Simpson and Bert Leek.

Drake Railway Auto Truck Company, New York City; $250,000; incorporators, F. E. Drake, A. Bauer, H. B. Tibbetts.

Mohawk Tire Company, Syracuse, N. Y.; $6000; to manufacture automobile tires; incorporators, Henry J. Moses, Winifred G. Rice, Clarence B. Rice.

W. F. Kerr Auto Supply Company, Inc., Philadelphia, Penn.; $5000; incorporators, L. C. Lee, William Embery, E. J. Laughlin.

General Auto Company, Camden, N. J.; $50,000; incorporators, Frank A. Kuntz, F. Stanley Saurman, Frank S. Muzzey.

Universal Car Company, Wilmington, Del.; $3,000,000; incorporators, E. E. McWhiney, William J. Mahoney, Herbert E. Latter.

The Amplex Motor Car Company, Wilmington, Del.; $1,000,000; incorporators, E. E. McWhiney, William L. Mahoney, Norman P. Coffin.

Baxter Side Car Company, Boston, Mass.; $20,000; to deal in motorcycles, motor vehicles, etc.; president, William P. Everts; treasurer, John R. Lazonby, and Edward T. Roche.

Plymouth Auto Company, Plymouth, Mass.; $2000; incorporators, Howard F. Eaton, Harriet M. Eaton, Carrie W. Finney.

Stewart Motor Corporation, Buffalo, N. Y.; $250,000; incorporators, Charles J. Bork, Bernard L. Fisher, William F. Strasmer.

Central Garage, Jacksonville, Fla.; $5000; to operate a garage; incorporators, J. S. Arnold, Jr., P. E. Harry, H. V. Arnold.

The Central Garage Company, Indianapolis, Ind.; $5000; incorporators, Walter Howe, Kirke Howe, H. R. Sterling.

The Aristos Company, Boston, Mass.; $1000; to sell automobiles on commission; directors, Treasurer C. D. Knapp, A. Leslie Harwood, Jr. and Thomas D. Luce, Jr.

Esco Sales Company, Niagara Falls, N. Y.; $10,000; incorporators, Joseph Dovesmith, Spencer B. Parker, Charles Gombert.

The Apple Electric Company, Dayton, O.; $300,000; to manufacture and deal in electrical ignition and starting systems for motor cars and all kinds of gasoline engines; incorporators, V. G. Apple, Oscar Apple, J. C. Slager, Clarence Keifer, Carl Bauman.

Forest City Automobile Company, Forest City, Me.; $10,000; incorporators, C. V. Robbins, W. B. Clark, J. A. Clark, J. L. Clark.

West Twenty-Fifth Supply & Garage Company, Cleveland, O.; $10,000; to deal in motor cars; incorporators, R. H. Robinson, O. W. Lillard, R. Schama.

Motor Transportation Company, Kenosha, Wis.; $25,000; to operate a motor delivery; incorporators, P. E. Haworth, P. W. Herman, I. Spencer Cox.

Knickerbocker Commercial Vehicle Company, New York City; $300,000; to manufacture commercial vehicles; incorporators, E. A. Dillenbeck, J. B. Williams, E. A. Smith.

Canadian Overman Company, Inc., New York City; $20,000; incorporators, A. Z. Gray, W. A. Pease, Jr., L. Wilmerding, D. Sage.

Roberts & Sherburne, Inc., Boston, Mass.; $30,000; incorporators, Edward R. Sherburne, W. Medford, Frank L. Roberts, William H. Whalen.

V-C Motor Company, Augusta, Me.; $100,000; to deal in motor cars; incorporators, Horace Mitchell, C. E. Smothers, William E. Sisk.

The Automobile Vehicle Corporation, Buffalo, N. Y.; $20,000; incorporators, L. A. Kenyon, Frank H. O'Neill, Otto A. Hagelm, James C. Fox.

Egypt Garage & Machine Company, Scituate, Mass.; $6500; incorporators, William E. Chaffin, Charles M. Litchfield, Charles W. Peare.

Shafer, Decker Company, Rochester, N. Y.; $50,000; president, Charles H. Shafer; treasurer, C. P. Hugo Schoellkopf; general manager, Frederick J. Decker; secretary, James B. Shanly.

Merchants Motor Service Corporation, Philadelphia, Penn.; $100,000; incorporators, William Vees, George B. Tets, George L. Oddy, Nathan W. Bushby.

The Worcester Spring Company, Worcester, Mass.; $25,000; to manufacture springs, etc.; incorporators, Charles B. S. Jackson, G. A. McKenzie, C. E. Sampson.

Seaton Wheel Company, Nashville, Tenn.; $130,000; to manufacture automobile wheels; incorporators, G. Jackson, Samuel S. Lord, B. C. Seaton, John T. Landis, J. Ray Boone.

Goldfinger Auto Renting Company, New York City; $2000; incorporators, Benedict Goldfinger, Walter E. Fisher, Isaac Wolf.

The Walker Tire Chain Company, Toledo, O.; $150,000;

incorporators, Henry F. Rohrman, Charles A. Newman Charles P. Eger, A. M. Edwards, George C. Bryce.

Saratoga Auto Company, Brooklyn, N. Y.; $5000; to deal in motor cars; incorporators, George D. Smith, 2123 Metropolitan avenue; Harry A. Bogard and Emily J. Bogard, both of 18 Furman avenue.

D. K. & D. Company, New York City, $5000; to manufacture motors; incorporators, Eckford D. DeKay, Sidney G. DeKay, Andrew C. Dam.

C. & T. Auto Specialty Company, New York City; $10,000; to deal in motor accessories; incorporators, George F. Connelley, John J. Treacy, John R. Hunt.

Service Recorder Company, New York City; $10,000; to manufacture automobile devices; incorporators, Harold F. Seymour, Frederick Seymour, Benjamin N. Levy.

Todd & Courtney Company, Barberton, O.; $10,000; incorporators, J. H. Todd, O. I. Courtney, L. E. Courtney, C. C. Courtney.

Federal Auto Accessories Company, Columbus, O.; $2000; incorporators, J. R. Loofburrow, H. M. McDonald, W. C. Wetherhold, E. J. Mace, M. L. Mace.

Schacht Motor Car Company, Los Angeles, Cal.; $100,000; incorporators, O. A. Walling, William Dietz, W. T. Kreitz.

Harvard Garage Company, Boston, Mass.; $5000; incorporators, E. F. Blake, John B. Lynch, W. E. Collins.

The Buroff-Fuller Motor Company, Watertown, Wis.; $30,000; incorporators, John M. Sorlie, Edward R. Buchholz, Martin O. Larson, Ragnvald Strum.

Brooks Motor Car Company, Buffalo, N. Y.; $100,000; incorporators, Herman G. Rechsteainer, George B. North, B. O. Kerr.

Electric City Specialty Company, Buffalo, N. Y.; $25,000; automobile specialties; incorporators, Joseph E. Stark, John H. Beer, Ida E. Stark.

Peninsular Automobile Company, San Francisco, Cal.; $15,000; to deal in motor cars; incorporators, H. E. Holmes, John D. Gish, W. T. Chubbuck.

Hippe Motor Car Company, Chilton, Wis.; $15,000; to deal in motor cars; incorporators, Robert H. Hippe, Herman Gierow, F. J. Egerer, George J. Berger.

A. B. Manufacturing Company, Poughkeepsie, N. Y.; $200,000; incorporators, Max A. Kotzen, Jacob Lichtenstein, Ralph H. Raphael.

Whiteboro Motor Car & Garage Company, Utica, N. Y.; $1000; incorporators, J. Webster Rogers, Mabelle G. Malsan, Adrian S. Malsan.

Stanley Automobile Company, Louisville, Ky.; $2000; incorporators, E. C. Walker, George H. Laib, W. B. Young.

Auto Repair Company, Savannah, Ga., $10,000; incorporators, Shelby Myrick and others.

C. D. Franke & Co., Charleston, S. C.; $250,000; incorporators, Emil H. Johnz and Julius H. Johnz.

Robinson Automobile Company, Charleston, S. C.; $20,000; incorporators, C. B. Huiet, Walter B. Wilbur, J. T. and V. F. Robinson.

Fiat Motor Car Company, Memphis, Tenn.; $20,000; incorporators, O. C. Fleumer, Nelson E. Taylor, H. O. Bell, J. W. Kirkpatrick and J. E. McCadden.

Newark Auto Truck Manufacturing Company, Newark, N. J.; $500,000; incorporators, L. W. Babbage, H. H. Poole, J. T. Walsh.

Brooks Motor Car Company, Buffalo, N. Y.; $100,000; incorporators, H. G. Rechtsteiner, G. B. North, E. O. Kerr.

Ohio Motor Car Distributing Company, Chicago, Ill.; $5000; to manufacture and deal in automobiles, motor vehicles, bicycles, etc.; incorporators, Joseph Slotow, Samuel C. Wood, Fred C. Churchill.

Dunn Flyer Company, Boston, Mass.; $50,000; aerial craft, etc.; directors, Stephen C. Burgoyne, C. D. Woodbury, R. Cushman.

Hubmark Rubber Company, Boston, Mass.; $25,000; to manufacture rubber goods, tires, etc.; incorporators, George H. Mayo, O. W. Smith, W. H. Mayo.

Perfection Aero-Navigation Company, Pittsburg, Penn.; $200,000; incorporators, Dyke Smith, Joseph Sinkovitz, W. L. Mooks.

Everitt Motor Car Company, Wilmington, Del.; $3,000,000; incorporators, Byron F. Everitt, Paul Smith, Harry W. Davis.

Field Electric 'Bus Company, New York City; to manufacture electric cabs, etc.; $10,000; incorporators, William Eastman, C. J. Field, Burgess Osterhout.

Garden Taxicab Company, New York City; $15,000; incorporators, Richard Gruen, G. R. Schulze, J. J. Harvey.

Knickerbocker Motor Car Sales Company, New York City; $10,000; incorporators, Benjamin Harris, R. L. Noah, William L. Robertson.

Trojan Rubber Company, Stamford, Conn.; $50,000; incorporators, E. G. Hoffman, C. F. Waterbury, E. H. Johnson, Robert A. Fosdick, W. H. Taylor.

Westwood Auto Garage Company, Westwood, N. J.; $10,000; incorporators, Walter Peveraly, A. H. Steele, Walter Halliday.

The Stark Rubber & Novelty Company, Canton, O.; $100,000; incorporators, J. J. Lisbae, Walter A. Stafford, D. L. Holwick, Lester King, W. E. Scherer.

The Lansden Company, Allentown, Penn.; to manufacture and sell motors; $1,000,000; incorporators, William D. Schantz, W. L. Case, W. J. Maloney.

WITH THE MANUFACTURER

The Eberly & Orris Company, Mechanicsburg, Penn., maker of wheels and spokes, has completed an addition to its plant, which is being used for the manufacture of automobile wheels entirely. The latest machinery for this work has been installed and the plant is in full operation.

The Clark Motor Company, one of the largest industries in Jackson, Mich., denies the report that it is contemplating the removal of its plant from the Michigan city.

The Automatic Starter Company was recently incorporated in St. Louis, Mo., with a capital stock of $50,000. The concern will manufacture an automobile starter, which is the invention of John J. Cochran of St. Louis. It can be built into an automoile engine or can be attached to it. It uses gasoline from the carburetor and operates by the pushing of a button. It is planned to build a factory in St. Louis.

Henry W. Ford, president of the Ford Motor Company, Detroit, has gone to Europe for the summer. He is taking the trip mainly for recreation, although he will visit many of the plants abroad.

The Warner Instrument Company, Beloit, Wis., maker of automobile speed indicators, is having a large addition built to its plant in South Beloit. The new structure it is claimed, will give the firm three times its present manufacturing capacity.

The C. R. Wilson Body Company, Detroit, has closed bids for a $75,000 factory building. The new plant will be five stories in height, 171 by 101 feet, and will be of brick and steel construction.

The Detroit Electric Appliance Company, Detroit, has closed a contract with the Oakland Motor Car Company, whereby the Deaco combined lighting and high-tension ignition system will be part of the equipment of the 1913 Oaklands.

The Argo Electric Vehicle Company, Saginaw, Mich., is making extensive additions to its plant. A new concrete and steel building, 140 by 160 feet, two stories in height, is being erected with foundations of sufficient strength so that several more stories may be added. With this building completed the company will be enabled to increase its output 100 per cent.

The England Manufacturing Company, producers of metal stampings and automobile accessories, formerly in Amesbury, Mass., has taken factory buildings in Detroit, at one time occupied by the King Motor Car Company. The concern is planning an enlargement of its business.

The Havers Motor Car Company, with factory headquarters located at Port Huron, Mich., is planning some extensive improvements and a considerable addition to its factory this fall. The plant at the present time is devoted exclusively to the manufacture of the Havers six-cylinder motors, and utilizes about 150,000 square feet of floor space.

The Panama Manufacturing Company has been formed in Malvern, Ark., for the purpose of making motor-driven trucks. S. F. Sherman of Chattanooga, Tenn., is president of the new concern, and it is said considerable Tennessee capital is interested in the project.

The Park Motor Car Company of Cleveland, O., recently increased its capital stock from $10,000 to $15,000, and changed its name to the Park Motor & Manufacturing Company.

The R-C-H Corporation, Detroit, recently signed contracts with J. A. Vilmure, Assumption, Ill., and G. C. Walker, Granville, N. Y., giving them the exclusive agency for the different models of the R-C-H cars in their respective territories.

The Triumph Manufacturing Company, maker of motorcycles, located at Detroit, Mich., is erecting a new factory, which will be fitted with entirely new equipment. The company plans to increase its output almost twofold.

The Miami Cycle Manufacturing Company, Middletown, O., has under construction a new five-story building, which, when finished, will cost approximately $250,000. The concern plans to increase its output considerably.

John A. Graham, at one time superintendent of assembling and testing at the Brightwood Motor and Manufacturing Company of Springfield, Mass., has been recently appointed engineer and superintendent of the Westfield Motor Truck Company at Westfield, Mass.

The Remy Electric Company of Anderson, Ind., is making plans for enlarging its factory. The company recently took a contract to furnish all the magnetos for one year for the Buick Motor Company and the Willys-Overland Company, necessitating an output from the Remy plant of 130,000 magnetos. The concern now employs about 700 people. The enlargement of the plant will make places for at least 300 more.

The Ideal Motor Ca[illegible]pany, maker of the Stutz car, was recently incorpor[illegible] under the laws of Indiana for

$100,000. The incorporators are Henry F. Campbell, Harry C. Stutz, William D. Myers, William F. Glickert and Everett L. Deupree. The West Virginia charter of the company was surrendered, the reincorporation being for the purpose of making the company a state institution and not a foreign corporation doing business in another state. The headquarters of the concern are at Indianapolis.

W. L. Rodgers, F. W. Newton and R. F. Ramsey have applied to the governor of Pennsylvania for a charter of incorporation under the name of Duquesne Motor Car Company. The company is to be formed for the purpose of manufacturing pleasure and commercial motor vehicles, accessories and supplies.

The Ross Gear & Tool Company is having a large addition built to its plant in Lafayette, Ind., which will give the company 50,000 feet of floor space when finished.

C. Lawrence Wisehart, Elmira, N. Y., has assumed the management of the Resilio Company, 511 South Clinton street, Syracuse, N. Y., maker of a new tire filling product.

The Firestone Tire & Rubber Company, Akron, O., has opened a branch in Montreal, Can.

Charles D. Schmidt, with headquarters at 416 Broadway, has been appointed sales agent for New York City by the Baldwin Chain & Manufacturing Company.

R. J. Mackensie, has joined the Kelley Motor Truck Company, Springfield, O., as purchasing agent.

The Webb Motor Fire Apparatus Company, St. Louis, Mo., it is reported, is to move to Allentown, Penn., in the fall. Mack truck interests are said to have stock in the company. During 1911 the firm made an even 100 pieces of fire apparatus. This year its business is reported as even larger. Milton A. Strauss, formerly with the Moon Motor Car Company, has been appointed sales manager for the Webb concern.

The R-C-H Corporation, Detroit, Mich, recently opened a branch and service station in San Francisco, Cal. A. E. Morrison, western sales manager, made the arrangements for the opening, the step being necessary in order to care for the increasing trade on the Pacific Coast. The building secured is a three-story structure, in the heart of San Francisco's automobile district, and provides 18,000 feet of floor space. The corporation now has stations and factory branches in Detroit, Chicago, New York, Boston, Philadelphia, Atlanta, Buffalo, Cleveland, Kansas City, Minneapolis, Denver, Los Angeles and Walkerville, Can.

The Penn Motor Car Company, formerly located in Pittsburg, Penn., now occupies its new factory buildings in New Castle, Penn., covering more than five acres. The main structure is 510 by 60 feet, and is used for the chassis assembling and chassis painting. Running back from this building are six wings, each 60 by 150 feet, which are to be used for the machine shop, upholstering and top departments, testing and repairs, stock rooms and final assembling. The entire building is of steel, concrete and glass. There is excellent light and ventilation, and one admirable feature is that there is not a post in the entire structure. Situated so that it can easily ship by four different trunk lines, the railroad facilities are excellent. The company makes pleasure cars and a light delivery motor car.

Harry E. Freeman, for 12 years connected with the advertising department of a prominent Cleveland newspaper, was recently appointed sales and advertising manager of the Sewell Cushion Wheel Company, Detroit.

D. E. Keith, manager of the Indianapolis branch of the Ford Motor Company, is makng a six weeks' tour over Indiana in a Ford car. He is visiting all of the 65 agents in the state, and making a thorough investigation of the automobile prospects in Indiana for 1913.

The G. & T. Tire Company has purchased a tract of ground, 170 by 220 feet, in Indianapolis, Ind., on which it will erect a five-story building of reinforced concrete to cost approximately $100,000.

The Dorris Motor Car Company's new factory, St. Louis, Mo., is rapidly nearing completion. The new building will mean practically a doubled capacity for the Dorris company. The structure is fireproof and three stories in height.

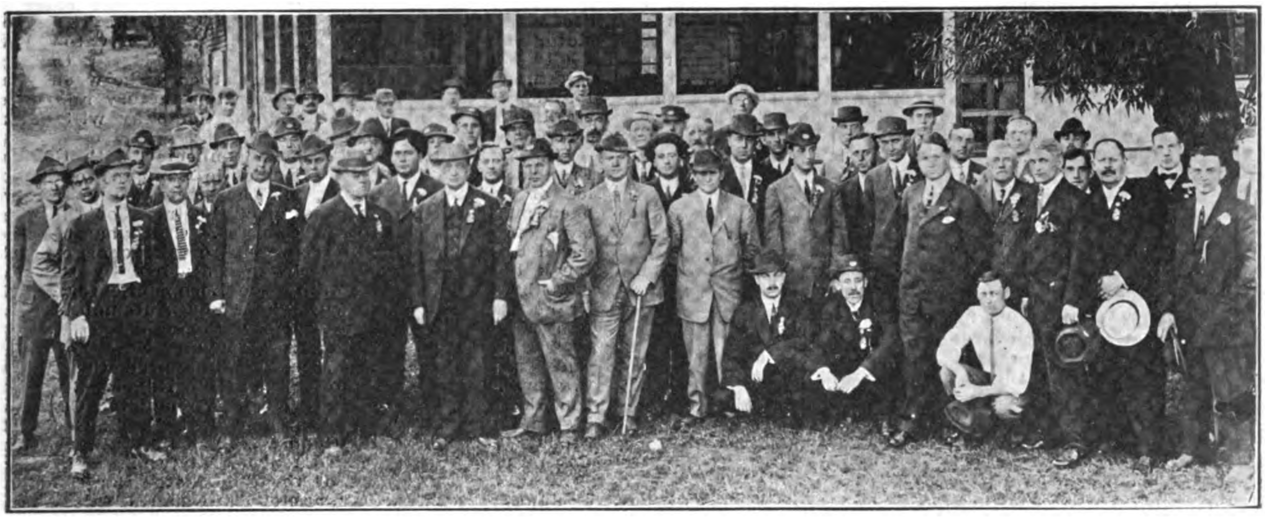
The Timken-Detroit Axle Company is having two large additions built to its plant in Detroit. The firm denies the report that it has purchased land in Toledo, O., and that a plant is to be erected there.

The Cartercar Company, Pontiac, Mich., has just closed a contract giving the MacEwen-Webster Auto Company of Swift Current, Sask., the agency for Saskatchewan, Alberta and Manitoba.

The Todd Manufacturing Company is to open a factory at 820 Mary place, Minneapolis, Minn., for the purpose of making radiators, hoods, fenders, drip pans, tanks and other sheet metal specialties for automobiles. The parties representing the firm are Frank Todd, formerly superintendent of the Long Manufacturing Company of Chicago and Detroit; B. A. Wolfe and Morgan C. Wood.

Arthur I. Philp has become associated with the Studebaker Corporation, Detroit, as assistant sales manager of the automobile division. He was until recently district manager for the United States Tire Company, and prior to that was with Morgan & Wright. In the old bicycle days he sold Imperial wheels for Ames & Frost.

The Willys-Overland Company recently held its annual district managers' convention at Toledo. The session was of three days' duration, the time devoted to business and to pleasure being almost equally divided. While the men assembled were busy enjoying the various entertainments and banquets they were also laying vigorous plans for 1913. Business meetings were held at the plant of the company each morning and afternoon, while the evenings were spent at the theatre or about the table. A power boat ride and banquet at the Toledo Yacht Club headquarters brought the convention to a close.



District Managers of the Willys-Overland Company at Their Recent Annual Convention in Toledo, O.

GARAGE & DEALER

W. W. Watson, agent for the Chessman estate, Denver, Col., has secured authority to erect a two-story automobile salesroom and garage at Colfax and Lincoln streets, the estate to be the owner. The structure will be 138 by 127 feet and will cost approximately $35,000. The building has already been leased for a term of years to the MacFarlane-East Auto Company, agent for the Packard and Buick cars and to the Cole Auto Company, agent for Cole cars. The salesrooms will be the largest and most finely appointed in the city of Denver.

The Abbott-Detroit Sales Company, Syracuse, N. Y., has opened a new garage on South Clinton street, near Tallman, where the Abbott-Detroit cars are handled and a general garage and repair business carried on.

D. W. Kaatze, 113 Keap street, Brooklyn, N. Y., is erecting a four-story brick garage at Ten Eyck and Lorimer streets, at a cost of $5000.

The Aston Motor Car Company, Bridgeport, Conn., is building an addition which will make its garage the largest between New York City and Boston. The addition has been specially planned for large motor trucks, and will be 60 by 100 feet. It will be fireproof, and is expected to be open in a short time.

The Fisk Garage, located on Washington street, Middletown, Conn., recently built an addition to the establishment, to enable it to take care of the rapidly growing automobile trade in the vicinity.

Thomas B. Dewhurst, owner of the Dewhurst Garage, Lexington, Ky., is planning to erect an addition to the establishment in the shape of a corrugated iron storeroom. It will cost in the neighborhood of $600.

Edward Wells has resigned as assistant sales manager of the E. R. Thomas Motor Car Company, to engage in the automobile business direct. He will assume control of the State garage, 119 East Third street, Jamestown, N. Y., and will handle Thomas cars and those of another well-known make; also a full line of tires and accessories. Mr. Wells has been connected with the Thomas company for 3.5 years. George Waite, late sales manager for the Simplex Motor Car Company, will take Mr. Wells' place at the Thomas factory.

The Los Angeles Branch of the Locomobile Company of America, with headquarters at Bridgeport, Conn., which was temporarily located at 942 South Grand avenue, Los Angeles, Cal., is now occupying new permanent quarters at Pico and Grand avenues.

F. H. L. James, who has operated the Central garage in Pawtucket, R. I., for a number of years, has opened the Central garage annex at 109 Exchange street. The new plant is in a round building with an inside diameter of 90 feet, which provides excellent facilities for the use to which it has been put.

The Lawrence Auto Company, New Castle, Penn., was recently purchased outright by the John Electric Company of the same city. Leo Collier, who was with the Lawrence Auto Company, has gone to Youngstown, O., where he plans to conduct an automobile garage.

Harold Boone is to spend $16,000 in the erection of a garage at Macon, Ga. This structure will be 52.5 by 150 feet, of mill construction, and electric lighted throughout. When finished the building will be one of the most up-to-date of its kind in the state.

George Baer, McKeesport, Penn., has a $20,000 garage, 60 by 134 feet, under process of construction in Ninth avenue, that city.

E. P. Moriarty & Co., of Kansas City, Mo., will represent the Lozier car, made by the Lozier Motor Company, Detroit, Mich., for 1913. In addition it will handle the Abbott-Detroit line, which has been handled by the Kaw Valley Automobile Company, of which J. F. Moriarty is the manager. The Kaw Valley company will be merged with E. P. Moriarty & Co., and the new firm name is to be the Moriarty Bros. Motor Car Company.

Byron & Brown, proprietor of the Lemoore garage at Lemoore, Cal., distributor of the Ford car made by the Ford Motor Company, Detroit, Mich., is having a large addition to its building. The remodelled structure will provide 1250 additional feet of floor space and will contain a magneto room and vulcanizing department.

Earl Howard, for several years engaged in the plumbing business in Bakersfield, Cal., is now doing business under the name of the Central Auto Supply Company, and will handle a complete line of tires, oils and automobile accessories. Mr. Howard has also taken the agency for Haynes and K-R-I-T automobiles.

The Eastern Motor & Conveyance Company is contemplating the erection of a public garage at Fayette street and Philadelphia avenue, East Baltimore, Md. Plans call for a one-story building of brick and reinforced concrete, 50 by 122 feet.

Aaron C. Cohen, who is associated in the automobile business with Frank M. Zimmerman in New Britain, Conn., recently bought the Ford agency in that city from H. B. Freeman of Hartford. The purchase included a number of new cars.

The Citizens' Motor Car Company, Cincinnati, O., recently leased three rooms in the new Steely building in that city. The company is agent for the Packard car, made by the Packard Motor Car Company of Detroit, Mich.

Collins & Dassonville, formerly of Brewster's in New York City, one of the largest coach factories in the United States, has decided to locate in Bakersfield, Cal., and will open a first class automobile painting and finishing shop. This will include a dust-proof finishing room, and equipment will be installed for enamelling, brass burnishing and polishing. Both men have had many years' experience at their trade.

C. B. Long has a garage 34 by 90 feet under construction at Fithian, Ill. The building will be of brick, two stories in height.

Cheatham Bros., Atlanta, Ga., is to erect a two-story building at 453 Peach street, for the use of the Velie Motor Vehicle Company as a garage. The building is to be of brick, and will cost approximately $5000.

The Pacific Coast Branch of the New York Lubricating Oil Company, sole proprietor and refiner of the Monogram oils and greases, has moved into its new general quarters at 516 Second street, San Francisco, Cal. The new location is a four-story building, fitted with the most modern appliances for the storage and handling of lubricating oils.

The East End Auto Company has extensively improved its property near 13th and Walnut streets, Harrisburg, Penn. The building has been enlarged and a modern repair shop and elevator installed. The company recently took the agency for the Atterbury truck.

The Cole Motor Car Company, Indianapolis, Ind., recently appointed the following agents: R. H. Smith, Deland, Fla.; Potter-Burgess Motor Company, 1013 State street, Erie, Penn.; H. B. Mahon, Follansbee, W. Va.; William E. Morse, Gorham, N. H.; Sanders & Dutton, Leesburg, Fla.; Cole Macon agency, 250 Second street, Macon, Ga.; Nashville Saddlery Company, Nashville, Tenn.; Harvey Case, Nakomis, Ill.; J. A. Rudy & Sons, Paducah, Ky.; St. Augustine Machine Works, St. Augustine, Fla.; C. C. Starbird, Strong, Me.; Arkansas Motor Company, Texarkana, Ark. J. G. Maxwell, who handled the Cole car successfully at Calgary, Alberta, Can., some time ago, has moved to Swift Current, Saskatchewan, and has made application to handle the Cole product there.

William E. Brown, Yonkers, N. Y., has bought the Riverdale Avenue Garage, 217 Riverdale avenue, that city.

The Morgan Construction Company is to build a garage, steel and pattern storage building, at 15 Carbon street, Worcester, Mass. The new building will be of brick, steel and concrete construction and will cost $10,000.

R. E. Donaldson is having a garage, 50 by 120 feet, erected in Milford, Ia. He will conduct a salesroom and service station.

The Northside Garage in Belleville, Kan., was recently purchased by A. J. Budworth.

The Taylor Garage in Walla Walla, Wash., has been bought by J. H. Abbott, who plans to continue the business.

W. H. Abbey, owner of the Wasso, Cal., garage, has sold the business to I. H. Litten.

The Standard Motor Car Company, which covers the Pacific Coast and operates distributing agencies in San Francisco, Oakland and Los Angeles, for the sales of Stoddard-Dayton cars, made by the Dayton Motor Car Company, Dayton, O., is to give a two weeks' vacation in the East to the salesman who makes the best record between May 1 and July 31. The Stoddard-Dayton factory and other plants of the United States Motor Company will be included in the itinerary.

H. W. Evans, who has been connected with the San Francisco branch of the Locomobile Company of America of Bridgeport, Conn., for the past two years, has been put in charge of the truck business of the company on the Pacific Coast. George A. Crane has been secured by the Locomobile company to take charge of the truck business in the territory controlled by the Chicago branch. Before joining the Locomobile forces, Mr. Crane was connected with the Knox Automobile Company and the United States Motor Company.

The American Locomotive Company, New York City and Providence, R. I., recently announced the following new dealers added to its list: H. T. Rogers, Binghamton, N. Y.; Six Thirty-eight Tire & Vulcanizing Company, Memphis, Tenn.; W. H. Ash, Peekskill, N. Y.; George E. Stocking, Rochelle, Ill.; Geddes & Sheffield, Calgary, Atla., Can.; Taylor & Musson, Edmonton, Alta, Can.

J. J. Cole, president of the Cole Motor Car Company, Indianapolis, Ind., accompanied by General Sales Manager Charles P. Henderson and William L. Colt, the latter of the Colt-Stratton Company, New York City, eastern distributor for Cole cars, have been making a tour of the agencies in the East. The first stop was in Pittsburg, from which city they went to Washington, Baltimore, Philadelphia and Newark, to New York, where a banquet was held, at which representatives of the metropolitan press were the guests of honor. A similar gathering was held in Boston.

G. A. Besosa of San Juan has taken the agency for the Marmon cars, made by the Nordyke & Marmon Company, Indianapolis, Ind. G. L. Omohundro of Little Rock, Ark., is also a new Marmon dealer.

The Henderson Motor Car Company recently awarded contracts to the following agencies: W. A. McKnight, Alexis, Ill. Johnson Motor Car Company, Philadelphia, Penn.; Service Motor Sales Company, Newark, N. J.; James A. Binney, Boston, Mass.; Atlanta Auto Sales Company, Inc., Atlanta, Ga.; Mattoon Refrigerating Company, Mattoon, Ill.; Bonnheim-Moore Motor Car Company, San Francisco, Cal.; the Blackhawk Auto Company, Waterloo, Ia.; A. C. Schafer, Grundy Centre, Ia.; Model Auto Sales Company, St. Louis, Mo.; Matheson Motor Company, Washington, D. C.; J. W. Wilcox, Los Angeles, Cal.; Whittlesey Garage & Machine Company, San Bonito, Tex.; J. J. Deskin, Missouri, Ia.

H. W. Yeager, president of the Yeager Piano Company, Hartford, Conn., has taken the agency for the complete line of Velie pleasure and commercial cars, made by the Velie Motor Vehicle Company, Moline, Ill. His territory will include Hartford and vicinity.

H. F. Sundin has become the distributor for the National car, made by the National Motor Vehicle Company, Indianapolis, for Kansas City and vicinity. He was formerly a travelling representative of the National company.

TRADE INFORMATION EXCHANGE
BUSINESS PROPOSITIONS.

Two Classes of Opportunities Are Offered Below—for Agents to Secure New Lines, and for Manufacturers to Secure Agents. These Propositions Offer State and Community Representation to Makers of Pleasure Cars, Motor Trucks, Accessories and Supplies, While Dealers May Get in Touch with Manufacturers Desiring to Extend Their Agency Connections. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without the Names of the Firms, Which Desire Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding to the Concerns.

CAR AGENCIES DESIRED.

948—Rhode Island Dealer, in excellent location, wants agency for cars selling at less than $1000, and trucks selling at $500 to $2000.

966—Michigan Concern, well established, would like to represent manufacturer of pleasure cars selling at $500 to $1500.

969—Ohio Company, recently organized, desires agency for pleasure automobiles selling at $900 to $1500.

973—Nebraska Concern, already carrying two well known lines, would add pleasure cars selling at $750 to $1250, and trucks from $800.

950—South Carolina House, located in rapidly growing territory, wants agency for pleasure cars selling at $500 to $2000, and commercial lines at $500 to $1000.

971—Kentucky Garage would add lines selling at $600 to $2000 to its present agency for pleasure cars.

988—Iowa Concern, already representing an established line, would add pleasure cars selling at $700 to $2000.

999—Illinois Agent, well established in growing community, desires agency for pleasure cars selling at $1000 to $2000.

1005—Central New York Company would represent manufacturers of pleasure cars selling at $1000 to $2500 and trucks selling at $500 to $9000.

1010—Connecticut Concern, with one established line, would add pleasure cars selling at $800 to $2100.

1011—Minnesota Truck Sales Company wants agency for power wagons selling at $750 to $2600.

1019—Ohio Sales Agency, with well established business, would add pleasure cars selling at $1000 to $3000.

1023—California Pleasure Car Agency, in splendid location, desires agency for trucks selling at $1500 to $3500.

1028—Mississippi Garage, recently organized, wants agency for pleasure cars selling at $500 to $5000 and trucks selling around $3000.

1035—Connecticut Garage, with well established business in large city, wants agency for pleasure cars selling at $550 to $6000 and trucks at $1000 to $5500.

1034—Massachusetts Dealer, with exceptional opportunity to sell electric vehicles, would secure agency for cars, preferably with capacity of from 750 to 1500 pounds.

EQUIPMENT NEEDED.

630—Rhode Island Garage, recently established, desires equipment for repair shop and vulcanizing plant.

641—South Carolina House, with well equipped repair shop, needs air compressors, gasoline storage tank and pump, and vulcanizing plant for retreading.

653—Iowa Concern, recently incorporated, wants all kinds of equipment for garage and repair shop.

660—Illinois Garage, with new building in course of construction, desires information relative to garage and repair shop equipment, machine tools, etc.

671—New York State Company, establishing garage in growing town, wants complete garage and repair shop equipment, machine tools, etc.

673—Connecticut Agency, contemplating the addition of a repair department, is in the market for repair shop equipment and machine tools.

675—Minnesota Truck Concern, establishing a service station, desires repair shop equipment.

683—Mississippi Agency, recently incorporated, wants garage and repair shop equipment, machine tools, etc.

684—Connecticut Concern, well established, but rebuilding after fire, wants garage, repair shop, machine tool and other equipment.

678-681—Two Inquirers desire full information relative to time clocks and systems adapted to the use of garages of moderate size. Two sets of literature should accompany all replies.

ACCESSORY AGENCIES.

923—Minnesota Sales Company, located in large city, seeks agency for chains, tops, power wagon equipment, supplies and accessories.

933—Ohio Concern, in well established location, would add to its line of accessories and supplies.

938—Mississippi Garage, recently incorporated, wants agency for all lines of pleasure and commercial car accessories and supplies.

943—Connecticut Garage, well established, wants line of supplies for small power wagons, and pleasure car accessories and supplies.

946—Rhode Island Concern, doing a good repair business, would add accessories and supplies for both pleasure and commercial cars.

958—Michigan House, recently organized, wants agency for automobile and repair shop accessories and supplies.

951—Ohio Agency, recently incorporated in growing city, wants agency for pleasure car accessories and supplies.

949—South Carolina Company, on direct southern travel, wants agency for tire covers, tire holders, medium price lamps, etc.

942—Kentucky Agency, recently incorporated, desires agency for full line of pleasure car accessories and supplies.

935—Iowa Concern, with well established agency for three lines of cars, is ready to take agency for all kinds of pleasure car supplies and accessories.

927—Illinois Dealer, building new garage, seeks agency for pleasure car accessories and supplies.

936—Central New York Dealer, with large field from which to draw business, desires agency for all kinds of accessories and supplies for pleasure and commercial cars.

MANUFACTURERS' OPPORTUNITIES.

827—New York State Concern, located in a rapidly growing city, has excess factory space and facilities and will consider proposition to combine with company manufacturing parts or complete vehicles.

869—Delivery Wagon Maker, producing vehicles with capacity of 1500 pounds and selling for $875, f. o. b., factory, wishes to establish agencies throughout the country.

821—Maker of Gasoline Gauge, with several new and exclusive features, desires to place agencies with established concerns in all parts of the country.

833—Truck Manufacturer, producing a wide line of gasoline and electric vehicles, with factory attention such as to justify careful inquiry, desires agents in open territory.

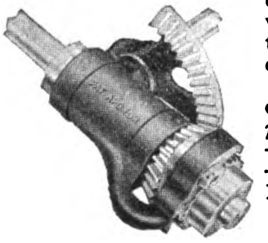
841—Spark Plug Concern, placing in the market a new and exclusive design, has a liberal contract proposition for those able to demonstrate their reliability and dependability.

A Perfect Starter At Last!

Energetic Dealers Wanted

A rare business opportunity. Live dealers throughout the entire world wanted to represent us and to install the National Starter

The First Perfect Mechanical Starter



It has always been said that if a *perfect* starter could be built—a *dependable* starter—one that would start the engine from the seat and forever do away with dangerous cranking—that such a starter would revolutionize motoring—that it would add the final touch of perfection to the automobile.

—and now, after years of experimenting, comes the first *perfect* mechanical engine starter—the NATIONAL STARTER—the *only* starter that is actually 100% efficient.

Works *every* time.

No batteries—no tanks—no wiring—no piping—no springs. Nothing but simple ball-bearing gearing.

Dealers in automobiles and accessories, and garage owners will instantly recognize the tremendous business possibilities of this new starter.

The Principle of the National

The National is built on a patented principle.

It is purely mechanical.

A simple pressure of the foot and the engine turns over—just like cranking.

The powerful leverage which is obtained through gear reduction turns the engine over easily—*so easily that you can start on the magneto just as readily as on the batteries.*

The National works equally well in hot or cold weather. It is *not* dependent upon acetylene gas, compressed air, gasoline, electricity or springs. It develops its entire energy through the slight pressure of your foot on the dash pedal—like a clutch. In case of back-fire the National automatically disengages.

We have subjected the National to the severest tests. We have tried it out in all sorts of weather and on all sorts of cars. We made it *prove* its merits.

And now we back every National with an ironclad guarantee for one year.

Easy to Install—Easy to Operate

The National can be installed on any car in about two hours' time. It is fastened to the front of the car in place of the crank. Total weight is about 15 pounds.

THE NATIONAL GAS ENGINE STARTER COMPANY

Dept. 563 B, 30-32 N. Dearborn St., CHICAGO, U. S. A.

Car Owners: *Write us for literature and name of nearest "National" dealer.*

Manufacturers: *Write us for literature and our offer to install the National as standard equipment.*

A ten year old child can operate the National easily. One pressure of the foot—the crank shaft turns—the engine starts. Just a simple mechanical operation.

A Big Business Proposition

The tremendous demand for a *perfect* starter makes the selling end of the National only a matter of proving its merits. *Thousands and Thousands* of car owners will install the National as soon as they see it.

They'll want the advantages of the National for themselves as well as to enable the women-folks to drive.

You see the field is practically boundless.

Big business men consider this a big enough proposition to *open up special demonstrating salesrooms for the exclusive sale of the National.*

They realize the wonderful possibilities of the National.

The retail price of the National is $50.00 *completely installed.* Figure out approximately the number of cars in your territory and you will have an idea as to how broad a proposition this is.

Applications for Agencies Now Being Received

Already we have received thousands of applications for National agencies. We are literally *swamped* with requests. South America, England, Germany, France—energetic dealers in all these countries have applied for National agencies as well as thousands of American business men. But we are prepared to meet the tremendous demand.

THE NATIONAL STARTER
TRADE MARK

We have practically unlimited manufacturing and financial resources.

Agencies for the National Starter are now being allotted. Applications will be handled in the order in which they are received.

Wire us, and come to Chicago if you can—let us show you just how the National is built—let us tell you in a personal interview the tremendous business possibilities of this proposition.

If you cannot come, write us. Full information and large descriptive circular can be had by signing and mailing the coupon.

Coupon for Free information

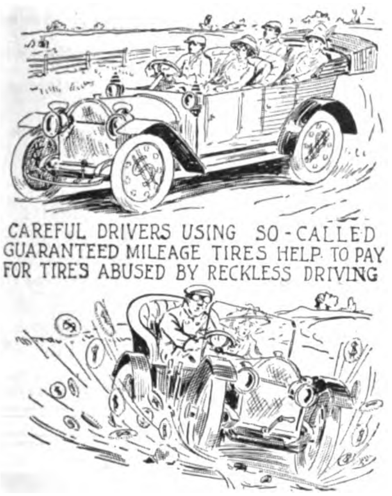
The National Gas Engine Starter Co.,
Dept 563 B, 30-32 N. Dearborn St., Chicago.

Gentlemen:

Please send me full particulars regarding a National Agency.

Name..

Address..


CAREFUL DRIVERS USING SO-CALLED GUARANTEED MILEAGE TIRES HELP TO PAY FOR TIRES ABUSED BY RECKLESS DRIVING

Why Pay For Tires Abused By Others?

Did you ever stop to think, Mr. User of Mileage Guaranteed Tires, that while you are following out the letter and spirit of your agreement by careful driving, proper inflation, and no overloading, there are scores of drivers paying no attention to these details. Factory perfect

FRONTIER TIRES

are guaranteed absolutely against mechanical imperfections and to afford reasonable service under ordinary conditions. Immediate and amicable adjustment will be made where Frontier Tires fail to give satisfaction.

Frontier Tires are lower than their competitors. Ask for a price list and be convinced. Also be up-to-date on tire matters by constantly asking your dealer for the latest Frontier tire-treating tips.

"Buy a Frontier Tire and Get a Long Run For Your Money"

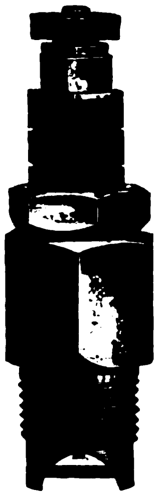
FRONTIER TIRE & RUBBER COMPANY

General Offices, 1054 Main Street, Buffalo, N. Y.

HI-PO WATERPROOF DRY CELLS

Absolutely Reliable—Each cell protected by an insulated waterproof case— Not affected by moisture—Can be exposed in any weather and in water. Not made by the Trust, but they cost no more. Your dealer or LINCOLN ELECTRIC CO. 1067 Atlantic Ave., Brooklyn, N. Y.

25c. ea.



HEINZE

Spark Plugs

Do not foul, soot or short circuit. A high grade plug at a low list price. Scientifically constructed. Our discount to jobbers and dealers makes the cost of these plugs very low. Write for catalogue.

SALES OFFICE DETROIT, MICH.

HEINZE ELECTRIC COMPANY

Station E LOWELL, MASS.

BETTER THAN ANY OTHER LUBRICANTS

HARRIS

TRADE MARK REG. U.S. PAT. OFF.

OILS

Used by discriminating motorists everywhere. Try them.

Sold in one gallon and five gallon cans and in barrels.

A. W. HARRIS OIL COMPANY,

326 S. Water St., Providence, R. I. 143 No. Wabash Ave., Chicago, Ill.

ABSOLUTE TIRE PROTECTION

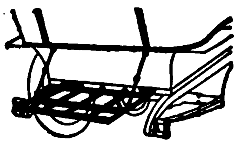
GIVEN ONLY BY THE

Hopewell Tire Case

It prevents any water entering the spare tire (either from rain or hose used in washing.) Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

Hopewell Brothers Newton, Mass.



"STANDARD" TRUNK RACKS

Connecticut Steel and Wire Co., Hartford, Conn.

Subscribe to The Motor Truck

ALL IN ONE
PATENTED
ALL IN ONE

THE "ALL-IN-ONE" SPARK PLUG

All That the Name Implies

Prime your engine and clean your plugs at the same time.

Price $1.50 Each

THE "ALL-IN-ONE" Starter Plug

First in the Field.

Can be used with any acetylene gas starter where gas is passed through the cylinder.

Price $1.50 Each

We shall prosecute vigorously all infringements now on the market or any which may spring up in the future.

FRONTIER SPECIALTY CO.

732 Main Street

BUFFALO - - - - - - NEW YORK

This is it

The Oil Most talked about today.

C THAT K

NO-KARBON

(REGISTERED)

EAGLEINE

AUTO CYLINDER OIL

The Oil with the 20,000 mile record.

Ask about it.

It suits and does not soot.

In 4 and 6 cylinder water cooled cars.

AGENTS

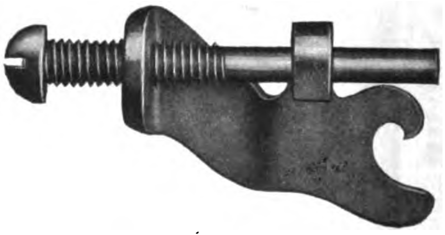
Proposition For Live Dealers

EAGLE OIL & SUPPLY CO.

104 Broad Street, Boston, Mass.

Q. D. RIM REMOVER

Saves Time, Labor, Trouble



Hook the tool over the outer edge of tire rim, between the two ends of locking ring. Push valve tube into rim so that locking lug clears inside of Shoe. Screw the bead ring off locking ring. It holds the rings apart, leaving both hands free to remove the locking ring. Nickelled and case hardened, it weighs 2 1-2 oz. If not carried by your dealer, mailed prepaid in the U. S. on receipt of 65c P. O. or EXPRESS MONEY ORDER, or 75c on check requiring collection charge.

Dealers and Jobbers, Write for Price List.

WM. L. TOBEY, - - 20 Lewis Street. EAST BOSTON, MASS

"PASS THEM ALL"

Knox

BEST BY TEST

MOTOR CARS

Send for Pleasure or Commercial Catalogue.

KNOX AUTO CO., Springfield, Mass.

New Departure "TWO-IN-ONE" Ball Bearings

The only ball bearing that takes load from any direction with equal efficiency.

Catalog for the asking

THE NEW DEPARTURE MFG. CO.
Bristol, Connecticut

STOLEN AUTOS

Can be prevented with our

AUTOLOCK SWITCH

Put on Coil or Dash in ten minutes. Yale key for plug. One operation. Write for descriptive folder and price.

BLACKBURN SPECIALTY CO., 1132 Prospect Ave., Cleveland, O.

FORD DEALERS

WE ARE SPECIALISTS ON FORD CARS

Get Our Catalog and Discount Sheet.

AUTO PARTS COMPANY

Station Sq. - - - - - - - Providence, R. I.

DEALERS **Why Not Handle The Best? Send For Our Illustrated Catalog**

SILVEY
STORAGE BATTERY
PATENTS
DAYTON, O.

The Silvey Electric Storage Battery will outlast two or three of any other make on account of extreme durability of positive plate.

Built for rough usage

No danger of short circuits.

Hard rubber separators throughout.

Strongest hard rubber jar of any battery.

SILVEY ELECTRIC SEARCHLIGHT LAMP

The most perfect lamp ever devised for automobiles.

Air tight construction. Silver reflectors do not tarnish.

Many points of superiority over any other lamp—Let us tell you about this wonderful lamp.

Write for catalog.

Silvey Electric Co., Dayton, Ohio

USE NO ACIDS

"Simplex" Aluminum Solder

WILL DO ALL THIS FOR YOU:

It has the holding grip on all soft metals; is non-corrosive and is a good conductor of electricity. Will solder everything—aluminum to brass, copper, etc. We will give $100 for any aluminum casting brought to us we cannot solder. We solder with an ordinary iron, and what we do solder, "STICKS" because it is in OUR SOLDER.

30 Cents

will bring you a sample to prove it to you.

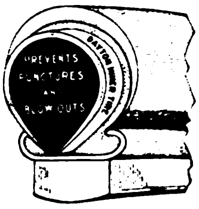
Special Inducements to the Trade.

Simplex Aluminum Solder Co., Inc.
108 Broadway, Long Island City, N. Y.
Tel. 988 Astoria.

Try the New Aluminum Solder. Ask for "Simplex."

"SIMPLEX" Solder has the stick.

TIRE TROUBLE STOPPED



Wear the tread completely off your tires by using the

Dayton Inner Tires

ABSOLUTELY prevents BLOW-OUTS, and 90% of PUNCTURES.
Prevents tube pinches from fabric breaks.
Easily inserted and can be changed from OLD to NEW casings.

Write (Right Now) for Descriptive Catalog.

AGENTS WANTED.

DAYTON INNER TIRE AND MFG. CO.,
DAYTON, OHIO, - - 17 Madison Street.

GARAGE OWNERS!

Avoid Dangers from Backing Out of Your Garage. Save Time and Labor.

UNIVERSAL AUTO TURNTABLE

Insures Careful Handling of Cars. Cuts the Cost of Car Storage.
Adapted for Public and Private Installation and for Any Service.
Get Booklet 4-C.

Canton Foundry & Machine Co., Canton, O., U.S.A.

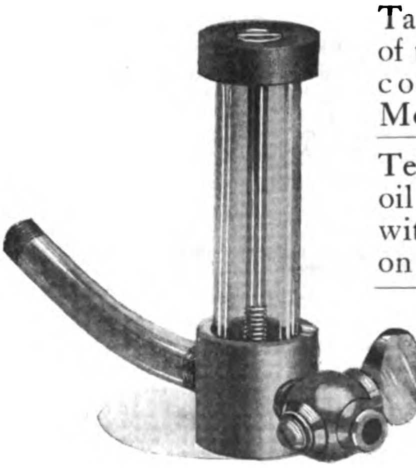
FRONTIER TIRES

are guaranteed factory perfect. They *cost less* than other standard tires. They are worth a trial. Ask for price list and trade discounts.

FRONTIER TIRE & RUBBER CO.
1054 Main Street Buffalo, N. Y.

TRADE APCO MARK

OIL GAUGE FOR Ford Cars



Takes the place of the lower pet-cock on the Model T Fords.

Tells how much oil at all times without getting on your back.

100,000 on Ford Cars all over the world

PRICE $1.00 DELIVERED

Liberal Discount to Dealers

25 OTHER SPECIALTIES FOR FORD CARS

CATALOG FREE

AUTO PARTS CO. (Station Square) Providence, R. I.

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, Mass.

Branch: 113 Massachusetts Ave., Boston.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.

Branch: 1974 Broadway at 67th St., New York.

Miller, Chas. E., 97-103 Reade St., New York.

Branches: 202-204 Columbus Ave., Boston: Bridge and Dwight streets, Springfield. Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York, 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 66 Edgewood Ave., Atlanta. Ga.; 601-603 Baronne St., New Orleans. La.; 135 Central Ave., Albany. N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

New Departure Mfg. Co., Bristol, Conn. (New Departure.)

BATTERIES.

Geiszler Bros. Storage Battery Co., 514 W. 57th St., New York.

Lincoln Electric Co., 1007 Atlantic Ave., Brooklyn, N: Y. (Hi-Po Waterproof Dry.)

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind. *Branches*: East Chicago, Ind., South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)

Branches: 903 Boylston St., Boston; 287 Lafayette St., New York.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Mayer Carburetor Co., 2673 Main St., Buffalo, N. Y. (Mayer.)

Sumner, George, Inc., 1841 Broadway, New York; 755 Boylston St., Boston. (Rayfield.)

CARS—GASOLINE PLEASURE.

Brush Runabout Co., 3 West 61st St., New York. (Brush runabout. Liberty-Brush.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clarke-Carter Automobile Co., Jackson, Mich. (Cutting.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)

Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Hupp Motor Car Co., 1268 Milkaukee Ave., East, Detroit. (Hupmobile.)

Branches: Detroit, Buffalo, Chicago. Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston. (Lenox.) *Branches*: New York, Boston, Chicago.

Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., Cleveland. (Peerless.)

Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

R-C-H Corporation, 107 Lycaste St., Detroit. (R-C-H.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)

Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)

Branchess See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st St., New York. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Federal Motor Truck Co., 114 Isabella St., Detroit. (Federal.)

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)

Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)

Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Peerless Motor Car Co., Cleveland, (Peerless.)

Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Stewart Motor Corporation, Buffalo, N. Y. (Stewart.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st St., New York. (Sampson, Brush, Stoddard.)

V. C. Motor Truck Co., Lynn, Mass. (V. C.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

Westfield Motor Truck Co., Westfield, Mass. (Westfield.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., Detroit. (Anderson.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 26 Cadillac Ave., Pontiac. Mich. (G. M. C.)

Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac. Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

BUYERS' GUIDE---Continued

United States Motor Co., 3 West 61st St., New York. (Sampson.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 893 Boylston St., Boston. (Baldwin.)

Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.

Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

J. & B. Manufacturing Co., Pittsfield, Mass. (Type J. C.)

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Automobile Supply Manufacturing Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston. (Jericho, Jubilee.)

IGNITION DEVICES.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Master Vibrator.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City.
Branches: 1700 Broadway, 212-214 W. 88th St., New York; 325 Columbus Ave., Boston; 1437 Vine St., Philadelphia; 1458 Michigan Ave., Chicago; 289 Halsey St., Newark, N. J.; Ocean and Third Aves., Asbury Park, N. J.; Bretton Woods Garage, Bretton Woods, N. H.; 1524 Grand Ave., Kansas City, Mo.; 803 Woodward Ave., Detroit; 448-450 No. Capitol Blvd., Indianapolis.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS—HEAD, TAIL AND SIDE.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)

Geiszler Bros. Storage Battery Co., 514-520 W. 57th St., New York.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Light Regulator.)

Remy Electric Co., Anderson, Ind. (Remy.)

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Haws, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Bldg., Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia. (Invader.)
Branch: 284 Columbus Ave., Boston.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia; 1436 Michigan Ave., Chicago; 1111 Superior Ave., N. W., Cleveland; 435 Turk St., San Francisco; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Standard Oil Co., New York. (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York.
Branches: Boston Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 605 Brown Bros. Bldg., Philadelphia; 154 Exchange St., Bangor, Me., 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.

Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)

Kimball Manufacturing Co., Motor Mart, Boston. (Mea.)

Marburg Bros., 1786 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., Walton Ave., and 138th St., New York.
Branches: 1679 Broadway, New York; 1110 S. Michigan Ave., Chicago; Motor Mart, Boston; 430-36 Van Ness Ave., San Francisco; 368 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.

MATS.

Sidwell Pedal Mat Co., 245 Columbus Ave., Boston. (Pedal.)

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

Emblem Manufacturing Co., Angola, N. Y. (Emblem.)

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Swenson, E. A., 298 Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Hazard Motor Manufacturing Co., 789 Coates St., Rochester, N. Y. (Hazard.)

Rutenber Motor Co., Marion, Ind. (Rutenber.)

PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

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PUMPS, OIL AND GREASE.

Randall-Faichney Co., Boston. (B-Line.)

PUMPS, TIRE.

Clarke Pump Co., 1489 Washington St., W. Newton, Mass. (Crown.)

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 908 Boylston St., Boston. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demontachable.)
Branches: New York, Chicago, San Francisco.

RIM REMOVERS.

Wm. L. Tobey, 20 Lewis St., East Boston, Mass. (Q. D.)

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 436 South Dearborn St., Chicago.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston. (Acme.)

Boyd, F. Shirley, 903 Boylston St., Boston.

Hartford Suspension Co., 146 Bay St., Jersey City. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Eliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York; 55 Boylston St., Boston. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Hardy Co., R. E., 1134 Austin Ave., Chicago. (Sta-Rite.)

Janney, Steinmetz & Co., Philadelphia.

Kimball Manufacturing Co., Motor Mart. Boston. (Lodge Double-Pole.)

Randall-Faichney Co., Boston. (Mac-Kae.)

Progressive Manufacturing Co., The, Torrington, Conn. (Black Eagle.)

Splitdorf Electrical Co., Walton Ave. and 188th St., New York.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston. (Mac-Kae Universal.)

SPEEDOMETERS.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland.

SPROCKETS.

Boyd F. Shirley, 893 Boylston St., Boston. (Baldwin.)

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Carbo-Light Co., 51st and Butler Sts., Pittsburg, Penn. (Carbo-Light.)

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

Page-Lester Co., 129 W. Van Buren St., Chicago. (Tite-Wud Rubber Putty.)

Perfection Filler Co., 421 Old South Bldg., Boston. (Perfection.)
Factory: Somerville, Mass.

TIRES—CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park Sq., Boston; 1731 Michigan Ave., Chicago; 905 First Ave., South, Minneapolis; 1529 Cleveland Place, Denver; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco; 917 E. Pike St., Seattle; 316 North Broad St., Philadelphia; 1197 Broadway, New York; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit; 1616 Grand Ave., Kansas City.

Dayton Inner Tire & Manufacturing Co., 17 Madison St., Dayton, O. (Dayton.)

Diamond Rubber Co., Akron O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J. Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Philadelphia, Chicago, Kansas City, Cleveland.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tires—Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron. O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS. (See Cars, Commercial.)

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Manufacturing Co., 1756 Cranston St., Providence.

TURNTABLES.

Canton Foundry & Machine Co., Canton, O. (Universal.)

Portland Garage, Portland, Me., (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WASHING DEVICES.

Perfect Manufacturing Co., Albany, N. Y.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WIRES AND CABLES.

Diamond Rubber Co. of N. Y., Akron, O. (Diamond.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

THE ACCESSORY -AND- GARAGE JOURNAL

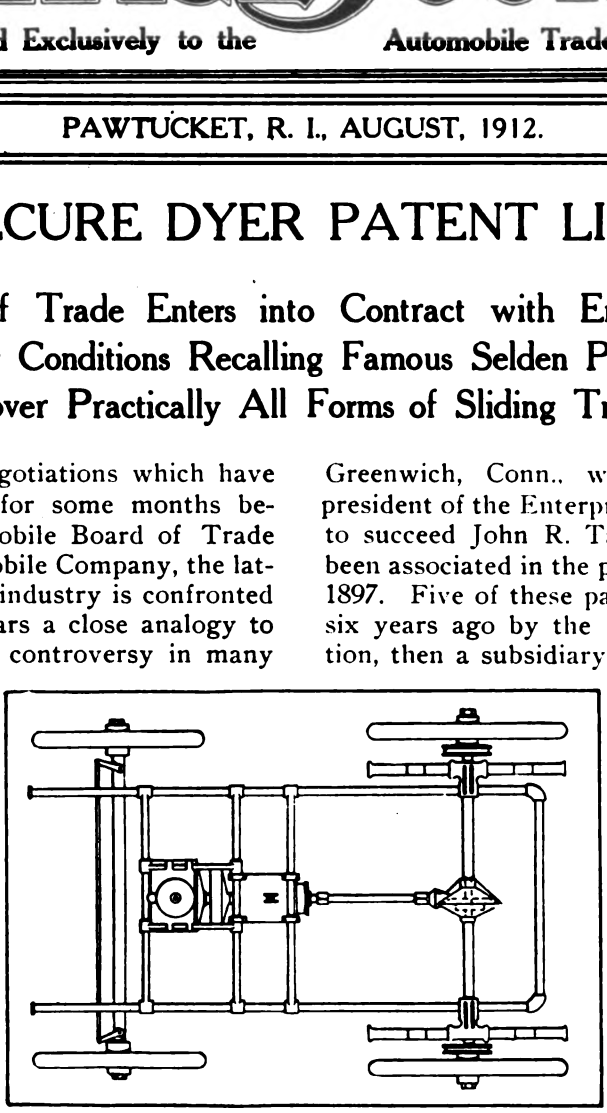
Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., AUGUST, 1912. No. 4

WILL SECURE DYER PATENT LICENSES.

Automobile Board of Trade Enters into Contract with Enterprize Automobile Company Under Conditions Recalling Famous Selden Patent Situation--Held to Cover Practically All Forms of Sliding Transmission.

As THE result of negotiations which have been carried on for some months between the Automobile Board of Trade and the Enterprize Automobile Company, the latter of Hoboken, N. J., the industry is confronted with a situation which bears a close analogy to the famous Selden patent controversy in many respects. The importance of the transaction, which involves the right to manufacture under the so-called Dyer transmission patents, is indicated in the official announcement of the Automobile Board of Trade under date of Aug. 13, as follows:



Showing Location of Dyer Patent Device, Looking Down upon a Motor Vehicle Chassis.

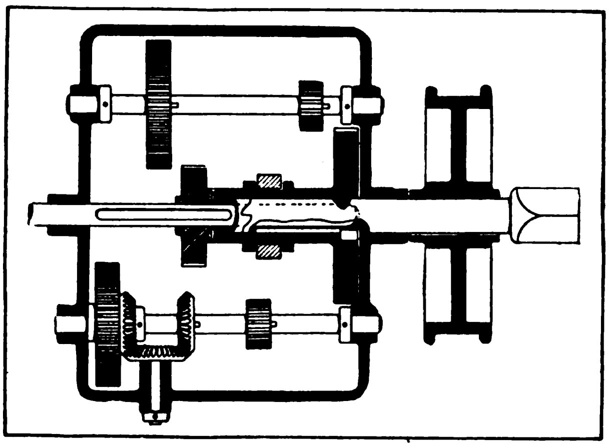
"After negotiations, extending over a period of more than six months, the Automobile Board of Trade has perfected an arrangement with the Enterprize Automobile Company, owner of the Dyer transmission patents, granting its members licenses to operate under them. The patent numbers are as follows: 643,595, 657,650, 662,400, 662,401, 676,223, 886,986 and 921,963. These patents cover practically all forms of sliding gear transmission in use on motor cars at the present time. The patents committee of the Automobile Board of Trade which successfully conducted the negotiations, is composed of the following: C. C. Hanch, W. H. VanDervoort, L. H. Kittredge, Alvan Macauley and L.E. Latta."

It should be stated that the patents mentioned above were issued to Leonard H. Dyer, now of Greenwich, Conn., who recently was elected president of the Enterprize Automobile Company, to succeed John R. Taylor, with whom he has been associated in the practise of patent law since 1897. Five of these patents were acquired some six years ago by the Patents Holding Association, then a subsidiary of the old Association of Licensed Automobile Manufacturers, which was succeeded by the Automobile Board of Trade soon after the adverse decision in the so-called Selden patent cases in January, 1911. These were the five first named, and they have been turned over to the Enterprize Automobile Company as a part of the consideration in the present contract.

Patent 643,595 was granted Feb. 13, 1900, and is held to cover two gears and an intermediate epicyclic gearing interposed between one of the gears and the driven axle. Antedating this a trifle in the matter of application is patent 657,650, which was granted Sept. 11, 1900, and is held to cover a fixed guide plate with recesses and notches to hold the gear shifting lever. Patent 662,400, granted Nov. 27, 1900, relates to the subject of two shafts with spur gearing and means for intermeshing the gear wheels so as to transmit power from the driving to the driven shaft. Patent 662,401 is for a multiple speed transmission gearing, and is similar to the main patent, described below except that the gears cannot be shifted as an entirety and the principle of direct drive with all gearing quiescent is not covered. Patent 676,223 is held to cover a removable rigid bridge to carry the motor and operating parts.

What is termed the main patent is that numbered 885,986, for which application was made Jan. 22, 1900, and which was issued April 28, 1908. This is claimed to extend backward in its effect to Feb. 3, 1900, inasmuch as it is declared to be a division of an application for a patent filed that date, which was later granted as patent 921,963 under date of May 19, 1909. This last patent is claimed to underlie the so-called main patent as a sort of foundation for it, and is held to cover improvements in the frame, driving gear, and changing and reversing mechanism of a motor vehicle.

While the main patent embodies 57 separate claims, and that upon which it is based, three more, it is assumed that the public will be interested in learning just what these claims may be. The sketches herewith are taken from the original patent drawings and set forth, in connection with the claims, the entire situation with respect to patents 885,986 and 921,963. The latter reads as follows:



Dyer Patent as Applied to Low Speed and Reversing Gears.

Claims of Patent 921,963.

1—The combination in a vehicle of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged substantially at an equal distance between the wheels and substantially parallel with the ground, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, means for breaking the connection between the two shafts and for connecting them together through power transmitting mechanism, affording a reduced speed, a differential gear between the second shaft and the wheels of the vehicle, and a reversing gear for reversing the direction of travel of the vehicle.

2—The combination in a vehicle of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of such motor, the said shaft being longitudinally arranged between the wheels, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, and means for breaking the connecting between the two shafts and for connecting them together through power-transmitting mechanism, affording a reduced speed.

3—The combination in a vehicle, of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged between the wheels, a friction clutch connecting the shaft with the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction of speed, means for breaking the connection between the two shafts and for connecting them together through power-transmitting mechanism, affording a reduced speed, and a reversing gear for reversing the direction of travel of the vehicle.

Claims of Patent 885,986.

1—In a transmission for motor vehicles, the combination of a driving member, a driven member, a driving gear for the former, a plurality of intermediate gears, including a reversing gear and means, including mechanism shiftable as an entirety, for driving said driven member through any one of said intermediate gears.

2—In a transmission gear for motor cars, the combination of a driving member, a driven member, a driving gear for the former, a plurality of intermediate gears including a reversing gear and means, including mechanism shiftable as an entirety, for coupling said driving member to said driven member and for also driving said driven member through any one of the said intermediate gears.

3—Transmission mechanism for motor vehicles, the same comprising a driving member, a driven member, means to couple said driven member to said driving member to be driven by the latter and means comprising mechanism shiftable as an entirety to drive said driven member at a different speed for said driving member and to drive said driven member in reverse direction from said driving member.

4—Transmission mechanism for motor vehicles, the same comprising a driving member, a driven shaft axially aligned therewith, means to couple said member and shaft, one to the other for direct drive of the latter by the former, a plurality of gears arranged out of line with the axis of said shaft and driven by said member, and a shiftable transmission device on said shaft and adapted to engage the said plurality of gears to drive said shaft in the same, and also in a reverse direction.

5—In a transmission gear for a motor vehicle, the combination of driving member, a driven member, and means comprising mechanism shiftable as an entirety coupling said driving member to said driven member to drive the latter from the former and for varying the speed and direction of movement transmitted from said driving member to said driven member.

6—Transmission mcehanism for motor vehicles, the same comprising a driving shaft, a plurality of fixed intermediate gears, including a reversing gear, means for supporting said gears, a driven shaft and means comprising a longitudinal, shiftable transmission device to rotate the latter from the driving shaft to any one of said intermediate gears.

7—Transmission mechanism for motor cars, same comprising a driving shaft, gear supporting means driven therefrom at a reduced speed, a plurality of fixed intermediate gears, including a reversing gear, a driven shaft and means comprising a longitudinal, shiftable transmission device to rotate the latter from the driving shaft through any one of said intermediate gears.

8—Transmission mechanism for motor vehicles, comprising a driving member, a driven member, a shiftable transmission member, means co-ordinate therewith to couple said driven member to said driving member, one or more stationary intermediate gears driven by said driving member and means to bring said transmission member into separate engagement and disengagement with said one or more intermediate gears.

9—Transmission mechanism comprising a driving member and a driven member adapted to be driven one by the other at the same speed, at different speeds, or in a reverse direction and mechanism longitudinally shiftable as an entirety for obtaining such changes in speed and direction.

10—Transmission mechanism for motor vehicle comprising a driving member, a driven intermediate gear, a jack-shaft arranged at transmission device on said shaft, means for coupling said driving member and said driven shaft one to the other for the direct drive of the latter by the former, one or more stationary gears arranged at one side of the axis of said shaft and driven by said driving member and means to shift such transmission device into engagement with the said one or more gears.

11—In a motor vehicle, a motor, clutch, driving gear and driven shaft, all axially aligned, intermediate gears between said driven shaft and driving gear, mechansim shiftable as an entirety to couple said driven shaft to said driving gear and to drive said shaft from said driving gear through any one of said intermediate gears, a jack-shaft arranged at an angle with said driven shaft and driven therefrom and vehicle driving wheels connected with and driven from said jack-shaft.

12—In a motor vehicle, a motor, clutch, driving shaft and driven shaft, all axially aligned, means comprising mechanism shiftable as an entirety for varying the speed and direction of movement transmitted from said driving shaft to said driven shaft, a jack-shaft arranged at an angle with said driven shaft and driven therefrom and vehicle driving wheels connected with and driven from said jack-shaft.

13—In a transmission gear for motor vehicles the combination of a driving member, a driven member, axially aligned therewith and means comprising mechanism shiftable as an entirely to couple said driving and driven members together and to vary the speed and direction of movements transmitted from said driving member to said driven member.

14—In a speed changing gear for motor vehicles, the combination with a motor shaft, a driven shaft, means for connecting the two together to secure high speed, a low speed gearing consisting of a plurality of gear wheels caused to engage by longitudinal shifting movements and means for producing reverse rotation of the driven shaft.

15—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the driving wheels and motors, the said gearing comprising a longitudinal shaft and a clutch connecting the shaft to the motor, and by means of which it will be driven, of means for rotating the wheels and a portion of the shaft at a different speed ratio, the said means including a jaw-clutch and longitudinally sliding gears, a single lever for sliding the gears and engaging and disengaging the jaw-clutch and a reverse gearing, and means operated by the said lever for engaging the reverse gearing.

16—In a motor vehicle the combination with a driving motor and driving wheels, of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch connecting the driving shaft to the motor, and by means of which it will be driven, connections between the driven shaft and the driving wheels, gearing connecting the longitudinal shaft to positively drive the driven shaft at low or high speed, and comprising longitudinally sliding gears and a second clutch, and a single manually operated sliding device for sliding the gears, and for engaging the second clutch.

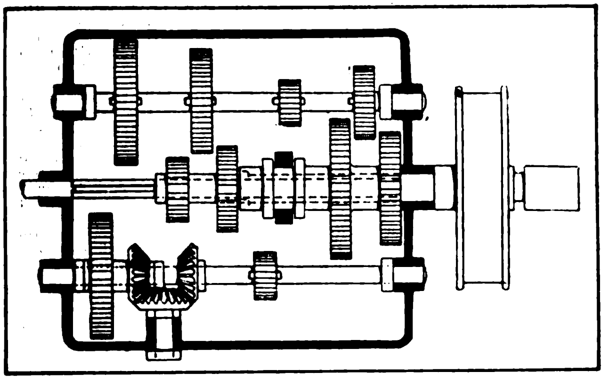
17—In a motor vehicle, the combination with a driving motor and driving wheels, of a gearing connecting the two, said gearing comprising longitudinally aligned driving and driven shafts and a clutch connecting the driving shaft to the motor and by means of which it will be driven, connections between the driven shaft and the driving wheels, gearing connecting the longitudinal shafts to positively drive the driven shaft at low or high speeds, and comprising longitudinally sliding gears and a second clutch, and a single actuating lever for sliding the gears and for engaging and disengaging the second clutch.

18—In a motor vehicle, the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch for connecting the two, for driving the driven shaft at high speed, and reduced speed gearing for positively driving the driven shaft at a reduced speed and means for engaging the said reduced speed gearing, the said reduced speed gearing being entirely disconnected when not in use, and being introduced and disengaged by a longitudinally sliding movement.

19—In a motor vehicle the combination with the motor and driving wheels of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch for connecting the two for driving the driven shaft at high speed, and reduced speed gearing and reverse gearing for positively driving the shaft at a reduced speed, or in the reverse direction, and means for engaging the said reduced gearing and reverse gearing, the said reduced speed gearing and reverse gearing being entirely disconnected when not in use, and being introduced and disengaged by a longitudinally sliding movement.

20—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising a longitudinal shaft, a clutch connecting the shaft to the motor and by means of which it is driven, connections between the shaft and the driving wheels, and a change speed device for rotating a portion of the shaft at a less speed than the motor, the said change speed device comprising an auxiliary shaft and gears on the longitudinal shaft, and means for intermeshing the gears by a sliding movement.

21—In a motor vehicle, the combination with the motor and driving wheels of a gearing connecting the two, the said gearing comprising a longitudinal shaft, a clutch connecting the shaft to the motor, and by means of which it is driven, connections between the shaft and the driving wheels and a change speed device for rotating a portion of the shaft at a less speed than the motor, the said change speed device comprising an auxiliary shaft, and gears on the longitudinal shaft and means for intermeshing the gears by a sliding movement, the said means comprising a single manually operated lever.



Additional Forward Speeds Obtained by Addition of Extra Secondary Gears on One of the Auxiliary Shafts, Together with Others on Main Driving Shaft.

22—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising a longitudinal shaft, a clutch connecting the shaft to the motor, and by means of which it is driven, connections between the shaft and the driving wheels and a change speed device for rotating a portion of the shaft at a less speed than the motor, the said change speed device comprising an auxiliary shaft, mounted in rigid bearings, gears rigidly mounted on the auxiliary shaft and gears on the longitudinal shaft, and means for intermeshing the gears by a sliding movement.

23—In a motor vehicle the combination with a driving shaft made in two parts, of a clutch made in two parts and connecting the shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, an auxiliary shaft, gears thereon and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft, to cause the two shaft parts to rotate at a different speed relation.

24—In a motor vehicle the combination with a driving shaft in two parts, of a clutch made in two parts and connecting the shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft gear thereon, the said shaft being mounted on rigid bearings and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft, to cause the two shaft parts to rotate in a different relation.

25—In a motor vehicle, the combination with a driving shaft made in two parts, of a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, and auxiliary shaft, gears thereon, the gears being rigidly mounted on the shaft and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

26—In a motor vehicle the combination with a driving shaft made in two parts, of a gear case, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft, mounted in rigid bearings, carried by the gear case, gears movable in a fixed plane with respect to said shaft, on the auxiliary shaft and means for longitudinally sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear, on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

27—In a motor vehicle, the combination with a driving shaft made in two parts, of a gear case, bearing on the gear case for the shaft parts, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft, mounted in rigid bearings, carried by the gear case, gears on the auxiliary shaft, the said gears being rigidly mounted on the shaft and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

28—In a motor vehicle, the combination with a shaft made in two parts of a gear case, bearings on the gear case for the shaft parts, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear upon the other shaft part and rotating with it, and auxiliary shaft, mounted in rigid bearings carried by the gear case, gears on the auxiliary shaft, and means carried within the gear case for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

29—In a motor vehicle the combination with a driving shaft made in two parts, of a gear case, bearings on the gear case for the shaft parts, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft mounted in rigid bearings carried by the gear case, gears on the auxiliary shaft, the said gears being rigidly mounted on the shaft, and means carried within the gear case for sliding the moving clutch part and its companion to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

30—A motor vehicle, having driving wheels, a motor, a shaft in line with the motor shaft, a clutch connecting the two to cause the shaft to rotate at the same speed as the motor, the shaft being longitudinally arranged between the driving wheels and divided into two sections, a device for connecting and disconnecting the two sections for causing them to rotate as an entirety or to permit independent rotation, means for rotating the rear section of the shaft at a lesser speed than the motor or in a reverse direction, said means including sliding gears, longitudinally movable in a fixed plane with respect to said shaft and mechanism for so moving said gears.

31—In a motor vehicle, the combination with a shaft formed of two parts, a connecting clutch and a gear on each shaft part, of a second shaft and gears thereon, and a single lever for shifting the gears on the first shaft and actuating the clutch.

32—Transmission for a motor vehicle, having a shaft formed of two parts, one telescoping within the other, connecting a clutch, a gear carried by one clutch member, a second gear connected to the first gear but freely rotatable with respect thereto, a second shaft, and gears thereon and a single lever for shifting said first gears, and actuating the clutch.

33—In a motor vehicle, the combination with a shaft formed of two parts, of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch, and engaging with one part, a second gear formed integral with the sleeve and engaging with the other part, an auxiliary shaft, gears thereon disengaged at the high speed, intermediate gears interposed between the gears on the second shaft, and means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears whereby the two parts of the shaft may be caused to rotate in different speed relation.

34—Transmission gearing for a motor vehicle, having a shaft formed of two parts, one telescoping within the other, a connecting clutch, a gear integrally formed upon one clutch member, a second gear, a sleeve thereon, connecting with, but freely rotatable with respect to the first gear, a second shaft with gears thereon and a single shifting lever for sliding first gears and disengaging the clutch.

35—In a motor vehicle, a gear case therefor, having a cover and supporting brackets, with a set of common securing bolts.

36—In a motor vehicle, a combination of a shaft therefor, formed in two parts, a fixed clutch member on one part, a movable clutch member on the other, gears connected to said movable member, a plurality of auxiliary shafts, gears thereon, and means for sliding said movable clutch member and connected gears along the shaft to disengage the clutch and intermesh the gears seriatim.

37—In a motor vehicle, the combination with the shaft, formed in two parts of a clutch for connecting parts together to cause the shaft to rotate as an entirety, slidable gears on the shaft's parts, connecting to and working with one clutch member, auxiliary shafts with gears thereon, and means, which being moved, will first disengage the clutch and move the gears to a position to engage with the gears on one auxiliary shaft to cause the shaft's parts to partake of the different speed relations, and the continuation of the movement will cause the gears to engage with the gears on the other auxiliary shaft and cause the shaft's parts to rotate in opposite directions.

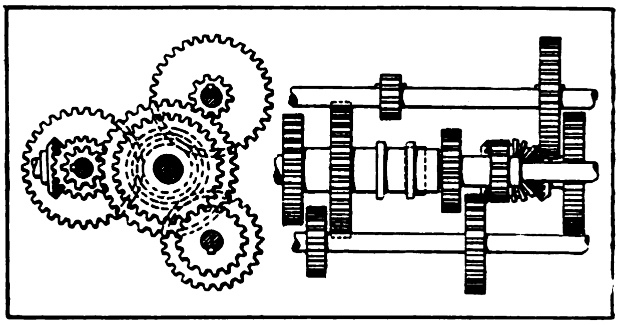
38—In a motor vehicle, the combination with an operating motor, of connections between the motor and the driving wheels, comprising a two-piece shaft connected thereto, connections to said shaft and driving wheels, a clutch connecting the two parts of the shaft, a gear carried by one part of the shaft, a second gear carried by the other part, connections between the gears and the clutch for moving altogether, an auxiliary shaft, two gears secured thereto, out of mesh with the other two gears at the high speed, a second auxiliary shaft, two gears secured thereto, normally out of mesh with the first two gears, intermediate gearing interposed between the two gears on the second auxiliary shaft, and means for disengaging the clutch and intermeshing the different gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

39—In a motor vehicle, the combination with the driving shaft made in two parts, of the clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch, a second gear formed integral with the sleeve and engaging with the other part, and an auxiliary shaft, gears thereon, disengaged at the high speed, and means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

40—In a motor vehicle, the combination with the driving shaft made in two parts, of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch, a second gear formed integral with the sleeve and engaging with the other part, an auxiliary shaft, gears thereon, disengaged at the high speed, a second auxiliary shaft gears thereon disengage at the high speed and means for moving the sleeve, gears and clutch to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate at different speeds.

41—In a motor vehicle, the combination with the driving shaft made in two parts, of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch and engaging with one part, a second gear formed integral with the sleeve and engaging with the other part, and an auxiliary shaft, gears thereon, disengaged at the high speed, intermediate gearing interposed between the gears, means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears.

42—In a motor vehicle, the combination with a motor and driving wheels, of connections between said motor and the driving wheels, including a two-piece shaft, a clutch connecting the two shaft pieces, gears upon the shaft pieces and auxiliary shaft with gears thereon, said gears being so arranged as to be out of mesh when the clutch is engaged, an element longitudinally shiftable as an entirety for actuating said clutch and intermeshing said gears, substantially as set forth.



Views of the Device as Seen from Above and from One End.

43—In a motor vehicle, the combination with the shaft formed in two parts, one telescoping within the other, of a connecting clutch, a gear integrally formed upon one clutch member, a second gear connected to the first gear but freely rotatable with respect thereto, a second shaft, and gears thereon, and a single lever for shifting said first gears and actuating the clutch, substantially as described.

44—In a motor vehicle, the combination with the driving shaft formed in two parts, of a fixed clutch member on one part, a sliding clutch member on the other part, a gear rigidly connected to said slidable member, a gear rotatably connected to said slidable member, and auxiliary shaft, gears thereon and means for moving said slidable clutch member and connected gears along the shaft to disengage the clutch and intermesh the gears.

45—In a motor vehicle, the combination with an operating motor, of connections between the motor and the driving wheels, comprising a two-piece shaft connected thereto, the connections between said shaft and driving wheels, a clutch connecting the two parts of the shaft, a gear carried by one part of the shaft, a second gear carried by the other part, connections between the gears and clutch for moving all together, an auxiliary shaft, two gears secured together, out of mesh with the other two gears at high speed, a second auxiliary shaft, two gears secured thereto out of mesh with the first two gears at the high speed, and means for disengaging the clutch and intermeshing the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

46—In a motor vehicle, the combination of the driving wheels, the motor, the driving shaft between the motor and driving wheels, made of two longitudinally aligned sections, a clutch arranged to couple the sections so that the driving shaft may turn as an entirety and longitudinally sliding speed reducing gearing arranged to connect the shaft sections, and so co-ordinated with said clutch that the engagement of said gearing will effect the prior disengagement of said clutch and vice versa.

47—In combination in a change-speed mechanism, a driving shaft, a driven shaft, gears mounted upon said driving shaft and driven shaft, intermediate gears on an axis in fixed relation with the axis of said driving and driven shafts, means for transmitting power from said driving shaft to said driven shaft through said intermediate gears, and means movable on the driven shaft for directly connecting the driving and driven shafts with all intermediate gears at rest.

48—In combination in a change-speed mechanism, a driving and a driven shaft arranged in the same axial line and adapted to have independent movement, change gears carried upon the driving and driven shafts, means for varying the position of said gears, power transmitting means adopted to connect a gear on said driving shaft and on said driven shaft and a clutch mechanism for directly connecting said driving and driven shafts.

49—In combination in a change-speed mechanism, a driving shaft, a gear borne upon said shaft, a countershaft, a gear borne upon the counter shaft and meshing with the gear upon the driving shaft, a driven shaft operatively arranged with relation to the driving shaft and provided with a clutch mechanism adapted to clutch it directly to said shaft, and intermediate gears borne upon the driven shaft and counter shaft, whereby the speed of the former may be varied with relation to the speed of the latter.

50—In combination in a change-speed mechanism, a driving shaft and driven shaft, a driving gear for the former, a plurality of intermediate gears including a reversing gear and means for driving said driven shaft through any one of said intermediate gears.

51—In combination in a change-speed mechanism, a driving shaft, a driven shaft, a plurality of transmission gears mounted to slide thereon, a plurality of intermediate gears arranged to engage and drive respectively, but singly, the said transmission gears, and means to couple said driven shaft directly to said driving shaft.

52—In a motor vehicle, the motor, clutch, driving gear and driven shaft, all axially aligned, means to drive said driven shaft from said driving gear at the same and also at different speeds, a jack-shaft arranged at an angle with said driven shaft and driven therefrom, and vehicle driving wheels connected with and driven from said jack-shaft.

53—In combination in a change-speed mechanism, a driving shaft, a driven shaft, a counter shaft in fixed relation to said driving and driven shafts, and operative gearing on said shafts, and inclosing casing, a bearing in said casing for one end of the driven shaft, the other bearing for said driven shaft being in the driving shaft.

54—In combination in a change-speed mechanism, a driving shaft and a driven shaft, operatively arranged, an inclosing casing, a bearing in said casing for one end of one of said shafts, the other end of said shaft having a bearing in the other shaft, a counter shaft in fixed relation to said driving and driven shafts and a plurality of gears connecting said counter, driving and driven shafts.

55—In combination in a change-speed mechanism, a driving shaft and a driven shaft, the driven shaft having a bearing in the driving shaft, and means movable on the driven shaft to engage the surrounding end of the driving shaft to rotate the two shafts at the same speed, a counter shaft in operative fixed relation to said driving and driven shafts and a plurality of gears connecting said counter, driving and driven shafts.

56—In combination in a change-speed mechanism, a driving shaft and a driven shaft axially aligned, a counter shaft in fixed relation to said driving and driven shafts, a plurality of gears connecting said counter, driving and driven shafts, and inclosing casing, a bearing in said casing for one end of the driven shaft.

57—In a transmission mechanism for motor vehicles, a casing, a driving shaft or shaft section projecting into said casing at one side, a bearing therefor in the wall of said casing, a gear and clutch part fixedly secured on or integral with said shaft section, and entirely on one side of said bearing within said casing, a driven shaft in said casing having a movable complementary clutch part, a counter shaft in fixed relation to said driving and driven shaft, and a plurality of gears on said shaft whereby varying speeds are transmitted to a shaft projecting from said casing.

ANOTHER OAKLAND BRANCH.

Following its policy of establishing branch houses in leading distributing centres, so as to improve the service end of the business and to facilitate the selling end, the Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, will take over the business of the Oakland Company of Pennsylvania, in Philadelphia, Sept. 1. The new branch will be in charge of Edward K. Leach, for some time past general manager of the Commercial Car Journal in that city.

SIMPLEX ALUMINUM SOLDER.

One of the difficulties with which repairmen must contend is that of soldering aluminum. This metal differs from ordinary materials, but it may be successfully handled if the right solder is employed. The Simplex Aluminum Solder Company, 108 Broadway, Astoria, Long Island, N. Y., is marketing Simplex aluminum solder which is designed for soldering aluminum parts as well as for joining brass or copper to aluminum.

According to the maker it requires no other tools than an ordinary copper soldering iron, and no acid, rosin or other similar substance is necessary in its application. All that is needed is that the work shall be free from dirt, grease, etc., and bright and clean. The parts to be repaired may be cleansed with gasoline and if very dirty or greasy, the foreign elements may be removed with nitric acid.

The simplicity of the operation will appeal to workmen who have struggled to secure good results. All parts are first tinned in the usual manner, taking care to have the iron clean, after which the solder is applied. When large castings or pieces are to be joined, which is held to be practical with Simplex solder, the parts should be heated to nearly the same degree as the solder. Brass or copper can be tinned with ordinary solder then joined to aluminum with the Simplex material, providing the work is free from acids. Simplex aluminum solder is inexpensive and is guaranteed by the maker.

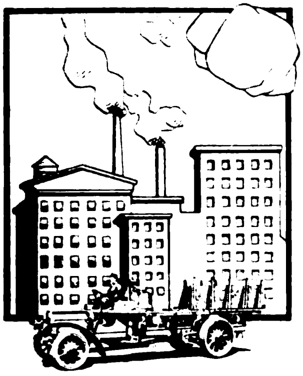
SECURES CONTROL OF THOMAS.

The entire control of the E. R. Thomas Motor Car Company, Buffalo, N. Y., was recently secured by interests closely allied with the United States Motor Company, New York City. President F. R. Humpage of the Thomas concern, it is stated, has secured an option of purchase of all the stock, and is now seeking the necessary capital to consummate the deal.

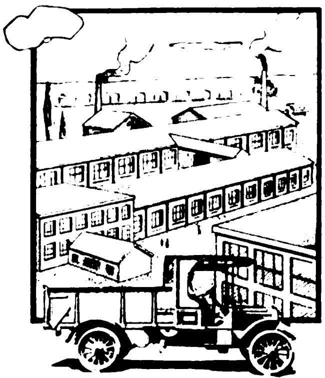
Although it has been known for a considerable length of time that the largest stockholders in the one company were the largest in the other, there has been no official confirmation of this. In addition to producing the regular Thomas line of cars, it is planned, also, to place a small six-cylinder machine on the market.

SLATER GOES WITH MICHIGAN.

William J. Slater, former advertising manager of the Firestone Tire & Rubber Company, has been added to the forces of the Michigan Buggy Company at Kalamazoo, Mich., maker of Michigan cars, as assistant sales manager. Mr. Slater is best known to the automobile industry and trade through his connection with the Firestone company, where his ideas, both in manufacturing and selling, have been adopted by a number of tire makers.



News Notes of the Industry



AGAIN INCREASES SPACE.

Maker of Paige-Detroit Cars Finds It Necessary to Secure Second New Factory Building.

It is announced in Detroit that the Paige-Detroit Motor Car Company has just closed a deal whereby it has acquired and will take over one of the United States Motor Company's plants located on Lieb and Larned streets, that city. This large factory will be devoted entirely to the manufacture of Paige motors, the motor department thereby being separated from the main plant, and leaving all the space in the latter for the other departments. The new motor plant is being equipped with the finest automatic machinery of the latest design and will have a capacity of 75 motors a day.

The latest addition by the Paige-Detroit concern has caused considerable talk in automobile circles, for it is the second time this company has increased its factory capacity this season. In March the demand for its product was so heavy that it was decided to double the factory capacity and for this purpose an entire building, located on the property adjoining the original Paige plant, was acquired.

CHANGE OF NAME.

Kelly-Racine Rubber Company Drops the First Portion After Two Years of Business.

The Kelly-Racine Rubber Company, Racine, Wis., has changed its firm name to the Racine Rubber Company. The concern has been organized for two years, during which time it has done an exceedingly good business in the manufacture of automobile and bicycle tires. The officers are: President, George B. Wilson; secretary and treasurer, Stuart Webster; general sales manager, H. L. McClaren.

The latter but recently joined the forces of the company. He has been in the rubber business for the past 12 years, starting with Morgan & Wright in 1900. He was with that company until the formation of the United States Tire Company, from which company he resigned as assistant to the central district manager in order to go to Racine.

SIMMS COMPANY PLANS.

Reorganizes with Additional Capital and Will Begin Production at Once.

The Simms Magneto Company, Bloomfield, N. J., has been reorganized with a capital stock of $1,750,000, of which $1,000,000 is represented by the old stock of the company, all common; the remaining $750,000 representing the new issue, of which $500,000 is preferred. The new preferred stock has been subscribed, and after the proceeds have been used in paying outstanding debts it is expected $350,000 will be left to take care of production, which will commence at once. The reorganized company will manufacture practically the same line of products as did the old Simms organization.

C. G. Stoddard, formerly connected with the Dayton Motor Car Company, and more recently with the Edwards Motor Car Company, has been elected president, F. R. Simms, who up to the reorganization was president, having resigned. Simms remains a director, and his associates are Edwards, A. A. Fisher, acting treasurer, who occupies a similar position with the Assets Realization Company of New York City, which company is financing the project; Campbell Carrington and H. M. Kilborn, the latter vice president of the National City Bank.

WILL DOUBLE OUTPUT.

Maker of Cutting Automobiles Will Occupy New Factory Addition This Month.

The Clarke-Carter Automobile Company of Jackson, Mich., maker of the Cutting automobiles, has nearly completed the large and extensive four-story addition to its present plant. The completion of this new building, which will so greatly facilitate manufacturing for the season of 1913 that the company will be enabled to double its production, will be occupied, it is expected, some time this month.

At present the Clarke-Carter factory is so congested that the concern has been experiencing difficulty in keeping abreast of its orders. Consequently the addition to the plant was made necessary, and it is planned to supply all the 1913 cars that can possibly be sold by the company's able corps of salesmen.

For Month's Trade Information and Industrial News See Last Section of This Issue.

NEW LOZIER MODEL.

Plans for Reorganization Completed with Election of Jewett as President.

Plans for the reorganization of the Lozier Motor Company of Detroit and Plattsburg, N. Y., which have been under way for several weeks, were completed at a recent meeting of the directorate in Detroit. H. A. Lozier, president of the company, resigned, and Harry M. Jewett of the Paige-Detroit Motor Car Company, also of Detroit, was named as his successor. Raymond B. Fosdick of New York was elected vice president and treasurer, and E. P. Earle and H. E. Kahler of New York were made members of the board of directors.

Coincident with the reorganization comes the announcement that the Lozier company will increase its capacity very materially and also add to its line of cars. Heretofore the Lozier has had nothing to offer except a 50 horsepower machine. It plans to have ready for delivery in about 10 weeks a model of less horsepower, but in every way up to the standard set by the Lozier company—the best for the money. The company will also add in the near future to its machine shops and the necessary financial backing for the increase in capacity and building have been made.

Harry M. Jewett is best known as one of the most successful coal operators in the country, although he has gained consideration since Jan. 1, 1911, as an important factor in the automobile industry, that date marking his connection with the Paige-Detroit concern. Raymond B. Fosdick, the new vice president, recently tendered his resignation as commissioner of accounts for New York City, to take effect Sept. 1. Mr. Earle is one of New York's best known business men, and Mr. Kahler is the junior member of the firm of O'Connor & Kahler, Wall street bankers.

The addition of Messrs. Jewett and Fosdick to the staff of the Lozier Motor Car Company does not mean a change in policy. On the contrary, it will continue along practically the same lines as in the past. Mr. Lozier will continue to take an active interest in the affairs of the concern. The balance of the organization, made up principally of Detroit men, will remain the same.

WILL STAY IN CLINTONVILLE.

Four Wheel Drive Concern Decides Not to Accept Offers from Other Cities.

After having received offers from several cities in the Middle West, the Four Wheel Drive Automobile Company, maker of the Four Wheel Drive car, has decided to remain in its present location, Clintonville, Wis. Among the offers made to the firm when removal from Clintonville was considered was one from a combination of business men in Appleton, Wis., who agreed to buy $100,000 worth of stock and provide shops.

Following its decision not to accept any outside offers, the company at once commenced plans for enlarging its factory at Clintonville and start its first regular issue of cars, including 11 commercial vehicles in 1.5 and three-ton capacities for the United States War Department. The directors have been given authority to place $25,000 of the treasury stock on the market for purchase. The capitalization of the concern is $250,000.

GROWTH IN OHIO.

Census Figures Show Remarkable Increase in Automobile Industry During Five Years.

The report of E. Dana Durand, director of the 13th census, shows a remarkable growth in the automobile industry in the state of Ohio. Ohio ranked second among the states of the Union in the manufacture of automobiles, including bodies and parts, both in 1909 and 1904. The total value of the products in the former year was $38,838,754. This represents an increase of $32,480,590, or 510.9 per cent., in value of products in five years.

In 1909 the total number of automobiles manufactured in Ohio was 14,299, valued at $23,550,112. The number was 409.2 per cent. greater than in 1904 and the value 353.1 per cent. greater. In 1909 Ohio was first among the states in the number and value of both electric and steam machines, producing 42.9 per cent. and 72.1 per cent., respectively, of those manufactured in the country. As all the steam cars were made by one establishment, they are included under the item "Electric and Steam" to avoid the disclosure of the operations of an individual concern.

In the item for "All Other Products" which includes the manufacture of additional parts, supplies, and other items not separately called for, an enormous increase is shown—from $1,160,804 in 1904 to $15,288,642 in 1909.

The following table indicates the increase in the industry in the five years, and other points of interest:

	1904.		1909.	
	No.	Value.	No.	Value.
Buggies, runabouts and touring cars..	*2,808	$5,197,360	11,539	$18,356,985
Limousines and cabs	**	**	1,185	2,775,891
Service vehicles.....	**	**	904	1,788,186
Delivery wagons....	**	**	469	242,105
Trucks and all others	**	**	202	386,945
Other products, including bodies, parts and repair work		1,160,804		15,288,642
Totals	2,808	$6,358,164	14,299	$38,838,754
Gasoline cars........	1,811	3,853,621	10,947	17,999,332
Electric and steam cars	997	1,343,739	3,352	5,550,780

*Includes "business vehicles" to avoid disclosure of individual operations.

**Not reported.

In another way the growth of the industry is shown as follows:

State of Ohio.

	1904.	1909.
Number of establishments......	22	75
Persons engaged...............	2,939	13,458
Proprietors	8	42
Salaried employees.............	209	1,286
Wage earners..................	2,722	12,130

Primary horsepower	1,877	14,433
Capital invested	$4,226,000	$30,892,000
Salaries paid	254,000	1,430,000
Wages paid	1,617,000	7,746,000
Cost of materials	2,553,000	18,522,000
Value of products	6,358,000	38,839,000
Value added by manufacture	3,805,000	20,317,000

City of Cleveland.

	1904.	1909.
Number of establishments	10	32
Persons engaged	1,949	7,115
Proprietors	3	20
Salaried employees	146	687
Wage earners	1,800	6,408
Primary horsepower	*	9,135
Capital invested	$3,095,000	$16,600,000
Salaries paid	194,000	875,000
Wages paid	1,027,000	4,023,000
Cost of materials	2,030,000	10,417,000
Value of products	4,624,000	21,404,000
Value added by manufacture	2,594,000	10,987,000

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*Figures not given.

NEW COMPANY FORMED.

Organization in New Orleans to Build Trucks and Conduct Service Station.

The Automobile Maintenance Company is a new enterprise just organized in New Orleans, La., with the support of a number of automobile owners. It is proposed to manufacture motor trucks and delivery wagons, and at the same time operate a maintenance plant, equipped to do every kind of work on all kinds of automobiles.

While the concern will begin in a modest way, the promoters expect to develop along lines that will eventually result in a real live industry. J. Raynaud is president; J. L. Blair, mechanical and consulting engineer, is vice president and Abner Powell is secretary and treasurer. Negotiations are pending for the erection of a building in Canal street to house the plant, and it is expected that operations will commence in a few months.

ABBOTT COMPANY'S HEAD.

Senator Knapp Succeeds the Late President Jamieson in Directing Concern's Policy.

State Senator F. M. Knapp of Warren, Penn., was elected president of the Abbott Motor Company, Detroit, at a meeting of the directors of the company July 27. His election fills the vacancy caused by the recent death of President C. W. Jamieson. H. M. Preston, also of Warren, formerly second vice president of the company, was elected vice president to fill the place made vacant by Senator Knapp's promotion. F. B. Jackson, who several months ago was appointed manager of the Jamieson estate, was elected a member of the board of directors. No other changes were made in the board.

President Knapp is heavily interested in a number of large business enterprises in the East. but will arrange to pass a considerable portion of his time at Detroit. At the meeting of the directors the company's business was reviewed in detail and expressions of gratification at the progress made during the last year were voiced. General Manager M. J. Hammers stated that announcements concerning the 1913 models would appear immediately. The company has already contracted for the disposal of practically its entire output of 1913 cars, 3500 in number, and new connections with many of the most enterprising agencies in the country have been effected.

ADDS MERCEDES TRUCK.

General Vehicle Company Will Manufacture Gasoline Vehicles as Well as Electrics.

The General Vehicle Company of Long Island City, N. Y., has secured the American right to manufacture and sell the Mercedes gasoline truck, built in Europe by the Daimler Motoren Gesellschraft, and President P. D. Wagoner of the company says that after 12 years of deep study on the manufacture of commercial vehicles, he has concluded that the Mercedes is the best truck in the world for long haul work in America. President Wagoner, accompanied by his factory manager and engineer, made a three months' tour of Europe in an effort to find what they regarded as a suitable gasoline truck for manufacture in this country.

P. D. Wagoner, President, General Vehicle Company.

The General Vehicle Company has held strictly to the manufacture of electric trucks, these being especially adapted to city work and all short haul demands. For longer haul cross country work, the gasoline vehicle was admittedly superior and when demands for trucks for that kind of work were received the General Vehicle Company cheerfully advised its customers of that fact. It was realized that the company should possess a complete commercial vehicle equipment for all lines of business and the acquirement of the American manufacturing and selling rights to the Mercedes fills this need.

A study of the American trucks convinced President Wagoner that they were built mostly for competition in the field of the electric vehicle and in his opinion were not well adapted to long cross country hauls. The Mercedes, he found, gave exceptional service in mountainous sections and rural districts and after some difficulty he succeeded in securing the right to import and sell the German commercial vehicles. The machines will be imported pending the completion of manufacturing arrangements. The American built Mercedes will be constructed from the original drawings of the Daimler Motoren Gesellschraft, which will also furnish materials, tools, jigs and fixtures.

BUYS BUICK PLANT.

Imperial Automobile Company Is to Quadruple Its Present Output of Pleasure Cars.

The Imperial Automobile Company of Jackson, Mich., has closed a deal for the purchase of the Jackson plant of the Buick Motor Company, with headquarters in Flint, Mich., which gives the Imperial two splendidly equipped factories. The new plant will have an additional capacity of 8000 cars, bringing the total output to 10,000 or over. It will employ 800 men and afford eight acres of floor space.

The Imperial company has been making cars for the past five years, and Col. T. A. Campbell, general manager, and the organization behind him, have been known for almost a quarter of a century from coast to coast as makers of carriages of exceptional merit. The additional production of cars and the possibilities of this greatly increased plant place the Imperial firm among the really big manufacturers in the automobile business in this country.

FORMS FOREIGN ALLIANCE.

American and British Engineers Combine to Promote Accessory Business Abroad.

Joseph A. Steinmetz of Janney, Steinmetz & Co., Philadelphia, and a member of the Society of Automobile Engineers, has become associated with R. W. A. Brewer of London, England, in a consulting capacity with a view to an exchange of opinions relating to American inventions and devices that may be used to advantage in Europe. Mr. Brewer will in turn advise Mr. Steinmetz as to such foreign improvements and inventions as may be applied with success to the American automobile output. The arrangement should prove of decided value to manufacturers in the United States, particularly those engaged in the production of motor car accessories.

In addition Mr. Steinmetz has purchased the American rights under a series of United States patents for the manufacture of the famous Sharpe silencer or muffler for automobiles. This device is known all over Europe and won the first, second and third awards at the official Autocycle Club tests relating to gasoline engine mufflers. It is made in all sizes and for all capacities, and can be designed for any case requiring individual consideration. As marketed by Janney, Steinmetz & Co., it will be produced in seamless steel, rather than in cast aluminum or cast iron, thereby increasing its efficiency, it is maintained.

Mr. Brewer has ordered a complete sample line of the seamless gasoline tanks, made by the Philadelphia concern, and will recommend these goods to the European pleasure and commercial car trade.

NEEDS OF EXPORT TRADE.

Striving to Secure Better Representation of American Interests Abroad.

American manufacturers and exporters have long recognized the need of some additional facilities by which they could be placed in closer touch with foreign buyers, particularly those in South America, Africa, Asia, Australia and other parts of the world where the markets are open. The lack of definite plan in this regard has impelled the Commercial Bureau Company of 50 Church street, New York City, to undertake the establishment of a foreign commercial bureau, which is sending to all American consulates card catalogue files, showing American manufacturers of all interests.

Branches have been located in South America, Africa, Asia and Australia, which points will act as distributing centres, and in which catalogues may be examined by buyers requesting them. It is estimated that this service will place the American manufacturer in direct touch with at least 10,000 purchasers from all parts of the world, each being an actual prospect, with a credit standing, and concerning whom information will be supplied.

MANUFACTURERS IN SESSION.

Midsummer Meeting of National Association Takes Up Several Important Matters.

The midsummer meeting of the National Association of Automobile Manufacturers was held at the summer home of the general manager, S. A. Miles, Christmas Cove, Me., July 30. This was a meeting of the executive committee, but arrangements were perfected for a convention of the entire association, to be held late in the fall or early winter. It is anticipated that a date some time in October will be selected, inasmuch as it will be at that time that drawings will be made for the shows in New York City and Chicago.

The Motor Car Manufacturing Company, Indianapolis, and the Warren Motor Car Company, Detroit, were admitted to membership, the former being represented by W. C. Teasdale and the latter by Lucius E. Wilson. H. F. Campbell of the Ideal Motor Car Company, Indianapolis, was selected to succeed E. G. Sourbier, Gleason Murphy to succeed J. F. Corl of the Rapid Motor Vehicle Company, Pontiac, Mich., and H. S. Stebbins to succeed A. M. Bentley of the Reliance Motor Truck Company, Owosso, Mich.

In considering the matter of the show circuit, St. Louis was eliminated, because the dealers in that city will hold an exhibition in October. Some discussion of the proposition to hold a midsummer truck show in 1913 was had, and the opinion of the members seemed to be about equally divided. The secretary of the commercial vehicle committee was instructed to secure the views of the motor truck manufacturers upon the subject.

Albert Pope, chairman of the traffic committee, reported progress in connection with freight rates, and also on insurance on commercial vehicles. He stated that fire underwriters were of the opinion that the risk was greater while the truck was on the road than while in the garage, and that the Automobile Underwriters' Conference is considering a reclassification of rates on these.

DEPARTMENT HEADS CHOSEN.

President Handley of Marion Motor Car Company Announces Factory Assistants.

President J. I. Handley of the Marion Motor Car Company of Indianapolis, Ind., announces the names of four men of particular prominence in the automobile world as the men who will constitute his executive staff in the reorganized Marion company. They are J. M. Edsall, M. B. Morgan, J. B. Myers and W. McKay White, all of whom are widely known in connection with their successes in the industry in recent years. For several weeks Mr. Handley has been arranging to secure men of most extensive experience to handle the big plans made for the production and distribution of the Marion cars. Already the factory has been occupied by the new interests and manufacturing on a large scale is thoroughly under way.

Mr. Edsall will be in charge of the finances and general accounting; Mr. Morgan will direct the designing and engineering; Mr. Myers is in charge of the factory production, and Mr. White of the advertising. All these men have been connected with the automobile industry in their respective departments for several years and each has an enviable record in the trade. During the next few weeks it is probable that one or two others will be added to the organization Mr. Handley is gathering about him and it is already known that the new men will be those of equally extensive experience and note in the motor car industry.

COLER MADE MANAGER.

To Have Charge of Advertising with Willys Group of Factories.

Ernest Coler, for a number of years connected in one way and another with the automobile industry, was recently appointed advertising manager of the John N. Willys group of motor car factories. He will supervise the work of the departments of the Garford Company at Elyria, O., the Gramm Truck Company, Lima, O., and the Willys-Overland Company, Toledo, O. His headquarters will be established in the general executive offices of the Willys interests.

Identified with the automobile business for a number of years, the new head of the advertising department of this immense concern is an expert on technical matters. Previous to joining the Willys forces he was assistant general advertising manager of the United States Motor Company, going to the latter concern after being advertising manager for the Maxwell-Briscoe Motor Company.

NEW SALES ORGANIZATION.

Well Known Tire Men Combine to Handle Lee Company's Entire Product.

No combination of recent years in the automobile tire industry should prove of more interest than that just completed by Charles F. U. Kelly, formerly president and principal organizer of the Kelly-Racine Rubber Company, and Harry E. Field, formerly vice president and general sales manager of the Hartford Rubber Works Company. They have just closed a deal with the Lee Tire & Rubber Company, of Conshohocken, Penn., to market its entire production of tires, tubes and other automobile accessories.

This combination brings together in one selling organization, two of the strongest, best known and most popular salesmen known to the trade, men who have the confidence of motorists from the Atlantic to the Pacific. Mr. Kelly began his tire career in 1893, with the Hodgman Rubber Company, then manufacturing bicycle tires. Shortly afterwards he joined the forces of the B. F. Goodrich Company, with which company he was associated for several years. He has since been continuously in the rubber field. Mr. Field, also a pioneer in the rubber tire business, is president of the T. B. Jeffery Company of New York, where he will remain until the expiration of his contract, which was accepted after his resignation from the Hartford Rubber Works Company, at the time of the formation of the United States Tire Company.

ADDITION TO MERCER PLANT.

New Structure to House Assembling, Finishing and Painting Departments.

Ground has just been broken in Trenton, N. J., by the Mercer Automobile Company, maker of the Mercer car, on which an additional factory building will be erected. The new structure, which will be 160 by 161 feet, was made necessary because of the growing business of the concern and the plans for an increased output in 1913.

The building will be of the saw-tooth type, and will house the assembling, finishing and painting departments, as well as the tin shop, riveting shop and storeroom. New machinery has been purchased and will be installed. Plans are also being drawn for a new office building.

TRADE INFORMATION EXCHANGE

BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding.

MANUFACTURERS' OPPORTUNITIES.

1001—Indiana Manufacturer, producing more than 5000 trucks annually, desires full information concerning combined electric starting and lighting system.

1012—New England Manufacturer would like to get in touch with producers of all parts for light commercial vehicles.

1015—Well Known Boston Jobber, who will leave on an extended foreign trip in January, visiting England, France, Germany and other countries, with a view to buying and placing supplies, desires to correspond with manufacturers who are interested in such foreign trade.

1025—Chicago Manufacturer wants to get into correspondence with producers of automobile accessories for use on its pleasure cars.

1027—Tire Filler Concern, well located in respect to shipping facilities, etc., desires agents in all sections of the country.

1033—Massachusetts Manufacturer of two-ton commercial vehicles, desires information concerning the purchase of channel iron for chassis and other parts.

1034—Arizona Truck Manufacturer seeks information concerning steel or wood block tires for such vehicles.

CAR AGENCIES DESIRED.

1062—Kentucky Firm, recently organized, would like agency for pleasure cars selling from $500 to $5000; and commercial vehicles from $750 to $2500.

1067—Utah Concern, well established, wants agency for pleasure cars and trucks selling at about $1000.

1071—Ohio Sales Company, in large city, desires information concerning cars listing from $1000 to $3500, with a view to taking an agency.

1073—Dealer in Washington State would like agency for cars selling at medium price.

1079—Tennessee House with numerous distributing branches in the South is interested in cars selling up to $8000 and in trucks listed at $1500 to $6000.

1082—Wisconsin Dealer, well established in good location, wants agency for cars selling at $900 to $1900.

1087—Pennsylvania House, with sub-agencies in several counties, would add agency for cars selling at $1750 to $3500.

1091—Kentucky Agency, already representing one line, wants to add cars selling at about $1000.

1095—Tennessee Concern, also covering parts of Mississippi and Arkansas, would take agency for cars selling at $1150 to $1750 and trucks selling at $900 to $2200.

1097—Michigan Dealer, well established, desires agency for pleasure cars selling at $800 to $1200.

1099—New Jersey Company, recently opened, wants agency for pleasure cars selling at $800 to $1700 and trucks from $600 to $1200.

2001—Boston Dealer seeks information concerning pleasure cars or trucks fitted as camp wagons.

2003—Vermont Agency, with well established repair business, wants agency for cars selling at about $2000.

2004—Louisiana Supply Company, representing two lines, desires information concerning pleasure cars selling at $1000 to $2500.

2006—Idaho Dealer seeks agency for pleasure cars selling at or below $1600.

2009—Massachusetts Dealer, well acquainted with managers and superintendents of electric lighting companies throughout New England, desires agency for electric and gasoline commercial vehicles, capable of climbing hilly streets at fair speed, and going over good roads at from 15 to 20 miles an hour.

EQUIPMENT NEEDED.

907—New Jersey Concern, recently established, desires equipment for garage and repair shop.

908—Seattle Tire Dealer, is interested in repair shop supplies and equipment for such work.

909—Milwaukee Company, just incorporated, is in need of garage and repair shop equipment and supplies, including machine tools, etc.

911—Iowa Concern, now building cement garage, wants equipment for garage and repair shop, including machine tools, etc.

915—Service Station in Salt Lake City is in the market for all kinds of garage and machine tool equipment.

923—Garage in New Jersey, recently opened, wants equipment and machine tools.

927—Concern in Kentucky, engaged in rebuilding automobiles, desires garage and repair shop equipment.

933—Chicago Manufacturer, recently incorporated, is in the market for machine tools, etc.

936—Tennessee Company, with well established garage, is desirous of adding to its garage equipment.

939—Taxicab Company in Ohio is interested in securing garage and machine tool equipment.

941—Pennsylvania Concern, now erecting building, wants garage and repair shop equipment.

947—New York Dealer in large up-state city desires garage, repair shop and machine tool equipment.

949—Baltimore House is in the market for gasoline storage systems, pumps, vulcanizer, vehicle washers, welding equipment, lathes and other miscellaneous equipment.

951—Michigan Garage, well located for tourist trade, seeks information concerning garage and repair shop equipment of all kinds.

953—Vermont Garage, in heart of touring country, would install needed garage equipment.

955—Connecticut Concern, well established, wants information concerning garage and repair shop equipment of all kinds.

957—California Company, recently incorporated, is in the market for garage equipment and supplies.

960—Ohio Concern, well fitted to take care of all sorts of repair work, is interested in repair shop equipment.

961—Michigan Garage, recently opened, seeks information concerning garage and repair shop equipment.

ACCESSORY AGENCIES.

970—Wisconsin Company, recently incorporated, seeks the agency for pleasure car accessories and supplies.

975—Dealer in Washington State, with well established garage and salesrooms, desires agency for pleasure and commercial car accessories and supplies.

978—Iowa Distributor, well located, wants agency for pleasure and commercial car accessories and supplies.

979—New York Garage, in growing city, would like agency for all kinds of accessories and supplies for all types of vehicles.

982—Michigan House, engaged in general repair business, wants agency for automobile accessories and supplies for garages.

986—Kentucky Dealer, well located, wants agency for pleasure and commercial car accessories and supplies.

992—New Jersey Garage, recently established, wants agency for pleasure car and garage accessories and supplies.

993—Tennessee Tire Concern, in large city, would add full line of automobile accessories and supplies.

999—San Francisco Jobber, well established, desires agency for all kinds of accessories, as sales representative for the entire Pacific Coast, including British Columbia.

1007—Idaho Company, just starting in business, seeks agencies for well known automobile and garage supplies and accessories.

1010—Louisiana Agency for pleasure and commercial cars would add full line of accessories and supplies for these vehicles.

1014—Connecticut Garage, recently opened, has splendid opportunity to develop good trade in representative line of automobile and power wagon accessories and supplies.

1010—Vermont Dealer, on line of summer tourist travel, seeks agency for pleasure car accessories and supplies.

1019—Michigan Concern, erecting new modern garage, wants agency for standard automobile supplies and accessories.

1022—Maryland Dealer, in excellent location, wants agency for tires, oils and similar goods.

1023—Baltimore Garage, now erecting new building, is interested in agency proposition for automobile accessories and garage supplies, **and later will be in the market** for repair shop equipment.

1028—Massachusetts Concern, well located in large city, is interested in securing the agency for automobile accessories of all kinds.

1029—Boston Dealer is interested in securing information concerning accessories and parts pertaining to the automobile industry.

1030—California Garage, in well established location, desires agency for automobile accessories and supplies.

TWO-CYCLE VS. FOUR-CYCLE MOTORS.

Two Somewhat Differing Views of Their Respective Merits by Men Who Have Given the Subject Much Thought and Attention—A Discussion Which Should Prove of Decided Interest and Value to the Trade.

Editor, Accessory and Garage Journal,

Sir:

Your July issue has been read with interest, but I am obliged to disagree with the article on two and four-stroke cycle engines in a number of respects.

Your article very correctly calls attention to the fact that the two-cycle does not begin to compress until the exhaust port is closed, and you very rightly assume that the compression pressures are the same. This should be the case, for proper comparison, but if it is the case, it means that the compression chamber of the two-cycle is about 25 per cent. smaller than the compression chamber of the four-cycle, and that, therefore, expansion of the working charge is carried farther in a two-cycle than in a four-cycle, because it is evident that the exhaust port of the two-cycle need not open any earlier than is customary to open the exhaust valves of the four-cycle; so that the working stroke length would be the same in each engine. This, while not strictly true, is not so far from common practise as to be an objectionable statement as understood by your readers. They will, therefore, see that if the compression chamber of the two-cycle if only half the size of that of the four-cycle, the gas would be expanded twice as much with great gain in economy. This is not an actual arrangement, but is mentioned to show that there is opportunity in a two-cycle for a considerable gain in economy, due to longer expansion of the gases.

I think your statement that the exhaust port opens at about 35 per cent. of the piston stroke, is not correct. Robert claims that the exhaust port for a high speed engine should open at 59 degrees ahead of the lower dead centre, and this is very closely 25 per cent. of the piston stroke, as above stated. My own practise is to open the exhaust port about 45 to 50 degrees, or practically the same as the four-cycle engine. This makes a very appreciable difference in your figures, but even with this correction, your figures are wrong, for plenty of two-cycle engines are running which develop 1.6 to 1.7 the power of a four-cycle of same bore and stroke. Facts like these are stubborn things and the theories must fit the facts.

If a three-port engine is used it is possible to ram into the crankcase by the inertia of the gas in the carburetor pipe, an amount somewhat above atmospheric pressure, but this is a matter that is not much understood, and, doubtess, this result is seldom obtained. I prefer to use the two-port engine with very light check valve into the crankcase, and this check valve permits drawing in mixture during the full piston movement, and does not permit any of it to escape, so that the new charge at moderate speeds can be just as big as in a four-cycle. It seldom is this big, however, because the crankcase has so much space or clearance that the piston working into it does not act like a good pump piston. The piston of the four-cycle has some clearance space, and so is also not a good pump piston, but this is better than the piston of the two-cycle and gets somewhat larger charges. This difference in charges taken into the crankcase is the principal difference between the two engines and accounts mostly for the difference in power and impulse.

Whatever charge is taken into the crankcase can be quite fully transferred and can be put on top of the old charge, completely expelling it so that when large charges are wanted, as for hard work in mud, or on hills, the two-cycle engine takes in as much fuel, or nearly so, as a four-cycle, and crowds all this fuel into the compression chamber with resultant purer charge and more power and impulse than a four-cycle can have, because it always retains its compression chamber full of old gas. This explains why the two-cycle pulls twice as good as a four-cycle at hard work and moderate speeds.

You assume that an ordinary muffler must have back pressure, but experiments show that mufflers can be built which actually suck on the cylinder, and this is easily done, so that a good muffler and its pipe will assist in transferring the new charge from the crankcase into the cylinder.

You are quite right in saying that the two-cycle is used much and performs well under certain conditions. When it has been so well perfected as the four-cycle we will wonder why we ever used that complicated device.

Very truly,

CHAS. E. DURYEA.

Saginaw, Mich., Aug. 12.

Editor, Accessory and Garage Journal,

Sir:

The recent abandonment of the two-cycle engine by two motor car builders, who for years have strongly advocated this type, leads one to wonder whether the limitations and operation of this motor are really understood by its adherents.

When Otto successfully applied the Beau de Rochas principles, the gas engine industry was put on a solid foundation. No sooner had he done so, however, than many tried to accomplish the results obtained by the four-stroke cycle by means of a two-stroke cycle. The Clerk cycle is today the method used exclusively in two-cycle engine work.

The four-cycle engine piston makes an out-stroke to draw the new charge into the cylinder, a return stroke to compress it, a second out-stroke to expand the burning charge, and another return stroke to push out the spent gases. The two-cycle engine combines these operations so that every out-stroke is a power stroke, and every return stroke a compression stroke. The functions of pushing out the burnt gases and the charging of the cylinder with fresh gas, are performed by compressing the fresh charge slightly in another chamber and connecting this chamber with the power cylinder when the pressure in the latter has been reduced by the opening of the exhaust valve or port. The entry of this new charge is supposed to displace the burned gas, so that only the fresh gas remains in the cylinder.

There are many theories regarding the state of the power cylinder just before the entry of the new charge, and it is at this point in the cycle that the two methods differ. The power and compression strokes of the two-cycle ought to be mechanically and thermodynamically superior to those of the four-cycle; mechanically, because there is no leakage from valves in the combustion space as in the poppet valve motors, or cylinder head packing rings in sleeve valve motors; thermodynamically, because the combustion space is of the ideal form without side pockets or irregular shapes. In spite of these advantages the brake mean effective pressure is usually about one-half that of the best valve-in-the-head or sleeve valve type four-cycle; what it would be if it had big overhanging pockets as in the usual T head four-cycle it is hard to conjecture.

At the instant of exhaust-opening the cycles differ.

The exhaust port of the two-cycle opens suddenly and the gases under pressure rush out. If the exhaust pipe is of some length the inertia of the exhaust leaves a partial vacuum in the cylinder. That this is true is shown by the exhaust-inertia engines and turbines which have been built and operated by French and American experimenters.

Lepape and Baldwin have shown that such engines will run very regularly if conditions are favorable. Kararodine has sold many gas turbines in which a small combustion chamber, fed at one end through a very light spring check valve, operated by the exhaust pulsation in a pipe 10 feet long. At the end of this pipe an ordinary De Laval turbine wheel is placed. The pulsations, depending upon the weight of the valve and the strength of the spring, average about 40 a second. Of course, in the usual two-cycle with different lengths of exhaust pipe and bends, elbows, etc., it is pretty hard to know just when the oscillations occur, and the partial vacuum induced often reacts upon the outgoing column of gas, drawing it back into the cylinder with a ramming effect, thus interfering with the recharging.

While such a situation makes the problem very complex, there are other considerations not to be overlooked. If by reason of high speed or slow combustion the cylinder pressure has not dropped to atmosphere when the inlet port opens then the higher cylinder pressure flows into the connecting pipe and forces the new charge back into the compression storage chamber until equilibrium is established. Then the flow into the cylinder begins. If a piston deflector is used it is not of much value as the flow is gradual and mostly over the top to the open exhaust port; if the engine is of the valve-in-the-head type, the flow is in straight lines to the exhaust port.

In the case where the cylinder pressure has fallen below the incoming charge pressure at the moment of its entry, then there is a strong tendency for the latter to pierce the old charge, intermingle with it and pass out of the exhaust port. There seems to be no set of conditions where the new charge enters the cylinder and forces the burnt gas ahead of it by a real displacement. Even in the latest Diesel engine, where an excess of pure cold air is pumped in through two valves at the head end, with the exhaust ports extending around the cylinder and uncovered by the piston at the end of its out-stroke—with all this care to prevent intermingling, the economy of the two-cycle is slightly less than the four-cycle.

The Clerk engine had its displaced cylinder so timed that during the second half of its pumping stroke the power cylinder was at the charging period of its cycle. The latest change in automobile two-cycle engines was to duplicate this action, therefore since its inception the principle of operation has remained unaltered.

The throttling action of the two-cycle type of engine is peculiar and has seldom been explained. When a four-cycle engine exhausts, the piston pushes out a certain definite amount of gas regardless of the throttle opening. If the cylinder volume is 100 cubic inches, with a clearance of 25 cubic inches, the piston will sweep out 75 cubic inches of burned gas at all positions of the throttle. The result is that if a small quantity of fresh charge is aspired there is but a small quantity of burned gas to weaken it.

The two-cycle system is just the opposite. With a cubic capacity of 100 cubic inches, assuming perfect displacement, at full throttle the new charge will be fouled with 25 cubic inches of burned gas which represents the clearance volume. At half-throttle only 37 cubic inches enter the power cylinder from the displacer, which even theoretically would push out only 37 cubic inches of burned gas; thus there remains 63 cubic inches of neutral gas to dilute 37 inches of fresh charge.

Similarly, 15 cubic inches of new gas would be mixed with 85 cubic inches of old gas. A point is soon reached in throttling where the resultant mixture will not burn, and as shown this point is reached much sooner in the two than in the four-cycle. Indeed some of the early motor car and motorcycle engines of the four-cycle type were governed by this method, more or less of the exhaust being retained in the cylinder on the exhaust stroke to dilute the charge drawn in on the suction stroke. As there was no throttle on the carburetor, the amount aspired depended upon the amount of dead gas held in the cylinder. This method was quickly abandoned because of the weakening effect upon the combustion.

The starting of the two-cycle liquid fuel engine has always been more difficult than the four-cycle. In the latter if the liquid separates out of the mixture it is swept in drops into the combustion cylinder. The subsequent compression re-evaporates it so that some kind of an explosion results. With the two-cycle, however, the mixture first enters the displacer. If settling occurs, the liquid falls to the bottom so that the transfer to the power cylinder may be almost pure air. "There's many a slip 'twixt the cup and the lip" is only too true of this type of engine, for although a fine mixture may be drawn into the displacer, there is no guarantee that it will reach the cylinder in the same state. Due to this rehandling of the mixture, the displacer may load up (called flooding) if the mixture is too rich for the temperature of the air. If speed has been attained, the results are better as a strong draft will push along much of the liquid. It would seem that a reliable self-starter would be a very necessary part of a two-cycle outfit. The four-cycle gets the mixture only where it is going to burn it.

Back firing is common to both types of engines, and is due to a slow burning mixture, flame being present in the cylinder when the inlet should occur. This slow burning may be due to a very late spark or to the improper proportions of fuel and air. When back firing occurs in the four-cycle it merely burns out the small volume of mixture in the inlet pipe, which is usually less than a cylinderful. This small quantity is quickly removed from the inlet pipe in a revolution or two of the engine. With the two-cycle crankcase compression type there is usually stored in the crank chamber three or four cylinderfuls of mixture, so that when this is ignited, it takes a number of revolutions to clear it out. The engine slows down perceptibly at each such backfire and often stops. The separate displacer type of two-cycle is better in this respect as the volume stored is less, but even in this case it is much more than in the four-cycle.

Many devices have been used to prevent back firing, all depending upon the principle of the Davy safety miner's lamp. These flame arresters are of the screen, cellular and spiral types. When kept clean so that soot and oil do not clog them they seem to be fairly efficient; they are, however, apt to restrict the free passage of the displacing charge. Most of the pioneer builders of the two-cycle marine engine after thoroughly testing them, build their engines without them.

Where the two-cycle fires every other stroke regularly the phenomena is termed four-cycling. This is due to an improper mixture for that speed. By weakening the mixture the engine will promptly two-cycle. Or if a heavier load be placed upon it, the speed will diminish and two-cycling will begin. This is often seen when travelling on a level road; the engine will four-cycle until a slight grade is encountered, when it will at once two-cycle with a lower rate of speed.

The brake power developed by this type of engine at high speed is, except in special cases, lower than in the four-cycle in spite of the more frequent impulses, and it is for this and the above reasons that many a two-cycle car builder has been disappointed in his product after building and testing same.

R. MILLER.

2136 La Fontaine Ave., New York City, Aug. 10.

BEAUDET IS SUPERINTENDENT.

T. J. Beaudet recently retired from the driving end of the automobile industry to become superintendent of the San Francisco agency of the Cadillac Motor Car Company, Detroit. Having been in connection with the automobile business practically since its inception in this country, he is credited with being one of the best mechanics in the United States. He is perhaps best known as the man who drove a car down the west coast of Mexico through a territory never before reached by a motor car and who holds many western road records. He has always driven a Cadillac.

WITH OLDS MOTOR WORKS.

L. Clyde Smith has been appointed advertising manager of the Olds Motor Works, Lansing, Mich. Mr. Smith has had long and exceptional training in preparing literature relative to the automobile business, on both the commercial and pleasure car ends. Recently he has been assistant to the director of advertising for the General Motors Company, Detroit. He was chosen for his new position by O. C. Hutchinson, general manager of the Olds Motor Works, who, in making his selection, followed a policy he has always observed, that of securing the services of men of broadest experience in their particular line.

MECHANICAL POINTERS *for* GARAGEMEN AND OWNERS

SIMPLE TOOL HOLDER.

Some repairmen jumble their tools together in an indiscriminate pile and lose considerable time in hunting for a particular instrument. A simple holder and one that is made easily is shown at Fig. 1 A. It consists of two strips of sheet metal .5 inch wide and as long as desired. A block of wood is inserted between the plates at either end and holes drilled to permit the use of screws for fastening the device across a window or wall as shown. In it can be placed screw drivers, files, etc.

HOME MADE KEYWAY CUTTER.

Many shops are not equipped with the proper tools to cut keyways in shafts and are obliged to have the work done outside. A straight keyway can be cut by the kink outlined at Fig. 1 B. It consists of two L shaped pieces of wood bolted together with another strip of the width of the keyway to be cut. This section is placed between the larger members. Hacksaw blades are then fitted, as shown in the illustration, and the parts drawn together and locked by the nuts on the bolts. The cut is made to the required depth and the metal chipped out with a keyway cutter.

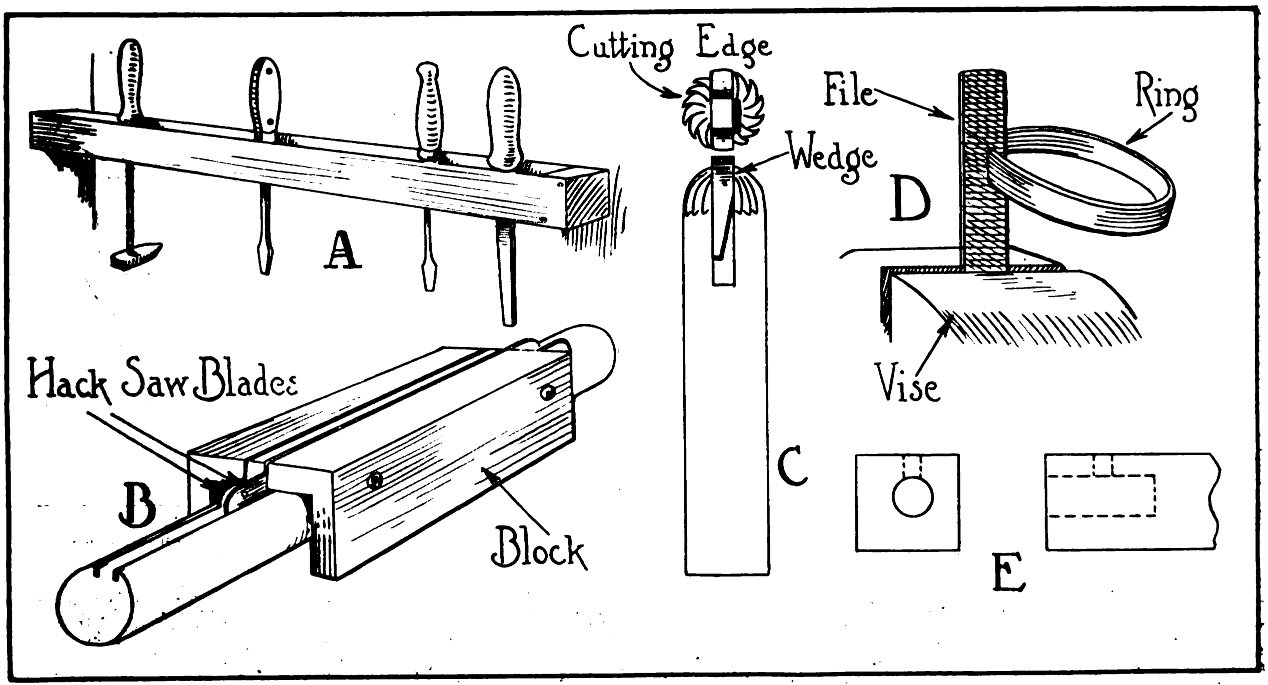


Fig. 1—Some Shop Repair Kinks: A, Inexpensive Tool Holder; B, Device for Cutting Keyways on Shaft; C, Adjustable Rose Reamer; D, Method of Filing Rings; E, Jig for Drilling Cotter Pin Holes in Small Rods.

ADJUSTABLE ROSE REAMER.

Often it is necessary to ream holes that previously have been drilled a size a little smaller than the desired furnished gauge. When it cannot be accomplished by redrilling with a twist or flat drill, and when a driving or good running fit is desired, it is imperative to make a tool, especially if the nearest flute reamer be too small or large. At Fig. 1 C is shown what is called a rose reamer, which is made quickly by turning a piece of steel to the correct size and length, and relieving it slightly from the cutting teeth back toward the shank. After the end is rounded the teeth are cut with a sharp half-round file and the tool hardened. It can be made adjustable by cutting a slot about .5 inch deep with a hacksaw, and inserting a thin wedge which is utilized for springing the sides apart. This will enable a slight increase in the size.

JIG FOR DRILLING COTTER HOLES.

Drilling holes in small rods to take cotter pins will be rendered easier by making a jig as shown at Fig. 1 E. The device is made readily and will prove a time saver where several holes are to be formed. A piece of cast iron is used and near one edge of the metal is drilled a hole to take the rod. Another aperture is made for the drill. The jig is then clamped on the drill press and the tool run through the opening as indicated in the sketch. With this a hole can be drilled through an ordinary wire nail and it also has the advantage of keeping the holes the same distance from the end of the rod.

FITTING PISTON RINGS.

In fitting new piston rings it is sometimes difficult to make the ends of the split fit close against each other. It also is an easy matter to spoil them when filing to size. At Fig. 1 D is indicated the use of a fine file clamped in a vertical position in the vise. The ring is held in the hands, pressed against the file and moved up and down.

ADJUSTABLE CARBON SCRAPER.

Some motors are fitted with the spark plug openings directly over and in the centre of the piston chamber and when such is the case the operation of removing the carbon and soot is an easy matter if one be provided with the proper tools. At Fig. 2A is depicted an inexpensive and easily made scraper which has an advantage over the ordinary form inasmuch as it is adjustable and may be constructed to be utilized on several different makes of engines.

It is produced from a round piece of mild steel, one end of which is looped for a handle. The other end is employed to carry the blade which is made with the sides hollowed slightly to hold the carbon. The top and bottom are provided with the usual scraping edges. The two pieces are fastened together by means of a screw and locknut.

NEW END FOR CRANKSHAFT.

A machinist who owned a motor car found that the end of the crankshaft had broken off, carrying with it the fan driving pulley and starting pin. The fracture was close to the bearing, making remedy difficult, and as a new shaft could not be obtained a repair was made in the following manner: The member was mounted in the lathe with the flywheel end in the chuck, the other being supported by a steady rest, while a .25 inch hole was bored about 2.5 inches long, as shown at Fig. 2B. This opening was coned out to a depth of approximately 1.75 inches, the largest diameter of the cone being within .125 inch of that on the bearing. The bottom portion of the first hole bored was then tapped, a piece of tough steel was turned to fit that in the crankshaft and enough metal left at the other end for machining to size. When this work was completed the shaft was placed with the damaged end upwards, the plug screwed in for about two threads, and the piece brazed. During the latter operation the new part was screwed down snugly as the spelter began to flow freely. The work was then mounted in the lathe and the repaired end turned between the centres in the usual way.

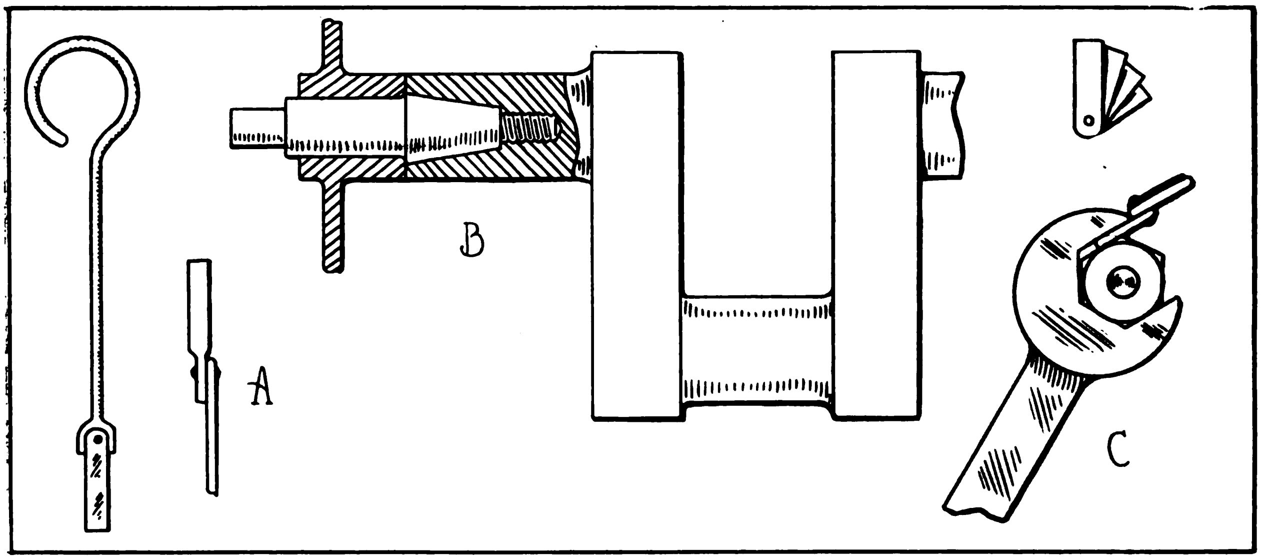


Fig. 2—Some Repair Shop Hints: A, Adjustable Carbon Scraper; B, Fitting New End to a Broken Crankshaft; C, Handy Wrench Device for Use on Odd Sized Nuts.

CLEANING CHAMOIS SKINS.

Chamois skins become dirty and coated with grease from continued use, but may be restored to a serviceable condition by first removng the caked dirt with a stiff brush, covering the skin with soft soap and allowing it to remain immersed for several hours in a bath of warm water to which should be added a little washing soda. The chamois is then removed and rubbed well, after which it is washed in a weak solution of soda, soft soap and warm water and hung up to dry.

THREAD MARKING ON BOLTS.

Sometimes bolts have to be shortened and the thread does not permit of the proper adjustment of the member or the nut. Where a die is not available the bolt can be marked for threading and new threads cut by the following kink: A piece of board is cut so that the notch will fit the nut, and a hole made at the other end by driving in a nail and drawing it out. A pencil is next inserted in the hole and the bolt rubbed with chalk. By turning the nut and attached wood device the pencil marks the bolt so that new threads may be cut with a three-cornered file.

REMOVING STUDS AND BOLTS.

When broken studs or bolts cannot be removed with the ordinary wrench the work may be accomplished by employing a larger tool and inserting a piece of a rough, round file. The wrench should be larger than the bolt to be loosened, in order to allow the file to be inserted, but it must not be wide enough to permit the latter to pass the centre, otherwise it would not be possible to obtain a hold. When the tool is moved to the right, the file bites, and the part may be moved.

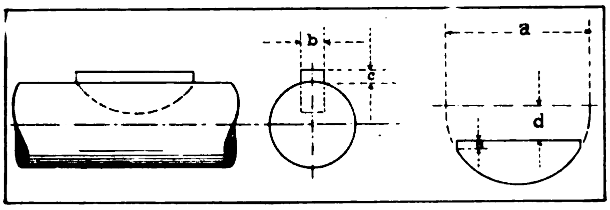
GAS ENGINES AT HIGH ALTITUDES.

The efficiency of a gas engine is affected by altitude, experiments developing the fact that there is a loss of about one per cent. of the indicated horsepower for each 1000 feet elevation above the sea level. The effect of an increase of elevation on a motor with a low ratio of compression is slightly less than that on an engine with a high degree.

USEFUL WRENCH DEVICE.

The repairman is called frequently to make some slight adjustment outside of the shop and often the work takes him some distance from the garage. It is not unusual to find that he lacks a certain S wrench to loosen an odd sized nut. At Fig. 2C is shown a simple device which can be made in a few minutes without any expense. It consists of a number of pieces of an old bandsaw fastened together by a rivet. One or more of the strips of metal are used as a packing.

SPECIAL WOODRUFF KEYS.



While most repairmen are more or less familiar with the regular or standard Woodruff keys and possess information relative to their sizes, the standard forms are not always as long relative to diameter and width as is desirable, hence, the common practise of using two of them side by side for long key slots. This does not meet with the favor of everyone, and a series of relatively long keys has been devised for the use of such.

These are similar to the standard, except that the distance from the centre of the circle to the top of the key; that is, the amount by which the key is less than a full half-circle, is materially increased. This greatly decreases the distance which the key is set down into the shaft, the latter being diminished proportionately to the former. To guard against a light, thin corner which would give trouble, these keys are cut off slightly on each end. In the table above, the figures correspond to those of the cut elsewhere on this page.

No. of key	Diameter a	Thickness b	Depth in gear c	Less than half diam. d	Width of flat e
26	2.125	.1875	.0937	.5313	.0937
27	2.125	.2500	.1250	.5313	.0937
28	2.125	.3125	.1562	.5313	.0937
29	2.125	.3750	.1875	.5313	.0937
30	3.500	.3750	.1875	.8125	.1875
31	3.500	.4375	.2187	.8125	.1875
32	3.500	.5000	.2500	.8125	.1875
33	3.500	.5625	.2813	.8125	.1875
34	3.500	.6250	.3125	.8125	.1875

POWER IN THE MACHINE SHOP.

In fitting up the garage machine shop the different sources of power are usually the first thing to be considered. In the specialized plant, repairing only one or two makes of cars, this is not the factor it becomes in the general shop, due to the fact that spare parts are carried in the stockroom and utilized to replace worn members, while in the general garage few if any parts are carried, and a saving of time and often of cost can be effected by making them.

The established repairman knows as to whether or not his present power plant is satisfactory and economical for the work he does, but the man equipping a shop for the first time must judge as to what his requirements will be. He must consider the number of hours a day he is likely to have work for his machines, whether the jobs will be short or long, how many machines will be in operation at once, the most economical location for the power plant, and others pertinent to the particular case. His choice will fall upon one of two sources of power; the gas engine or the electric motor. Steam is not applicable, except in unusual instances, as a steady steam pressure must be so low speed is resorted to, this giving the slowest speed of all, but the greatest tractive effort on account of the very large gear reduction.

This tractive effort can be expressed as a product of speed times pulling power, reducing speed causing corresponding increase in pulling ability. Thus if an engine has a pulling power of 300 pounds at 1000 revolutions, but the three gear reductions of the car were four to one on the high speed, 10 to one on the intermediate and 20 to one on low, the pulling power at these various speeds would be 1200, 3000 and 6000 pounds, respectively. If the road wheels were 34 inches in diameter, this would also give speeds of 26, 10.5 and five miles an hour, respectively.

Pitch is the distance from the centre of one tooth of a sprocket, chain roller, or gear tooth to the centre of the next one. This is called circular pitch and is expressed in inches and even fractions of an inch. It can be readily measured on a chain, while on a sprocket or gear, count the number of teeth and measure the pitch diameter (diameter of the circle on which the chain rollers revolve or the diameter of the intersecting circles upon which the two gears work). Figure the circumference of this circle, and divide by the number of teeth. The result is the pitch.

Diametral pitch is beginning to be widely used, but this is an abstract figure, representing the number of teeth for each inch of pitch diameter. To find this, measure the pitch diameter as before, and divide the number of teeth by it.

As a practical example, suppose a gear of five-inch pitch diameter and 40 teeth. The circular pitch is the circumference (five times 3.1416 or 15.708 inches) divided by the number of teeth or .3927 inches. The diametral pitch is the diameter five divided into the number of teeth 40, or eight.

A GEARBOX REPAIR.

The repairman is called upon frequently to exercise his ingenuity when making a repair on a car the owner of which objects to the expense of a new part or to losing the service of the machine. At Fig. 3 is depicted how a gearbox was repaired. The recess in the aluminum holding the bronze bearing had worn oval shaped, owing to the retaining screw having been left out in a previous overhaul or repair, and the bearing having revolved with the shaft. The method illustrated was adopted to obviate the necessity of reboring the aluminum and making and fitting a new bearing.

The bronze member was removed and a lining fitted accurately as shown in the sketch. Four .25-inch holes were drilled and tapped in the aluminum casing and four set screws fitted, these being utilized to adjust the bearing, as well as to line up the shaft and its gears. A paste was then made of clay and the inside and outside faces of the bearing covered with this material. White metal was next poured through the oil hole, filling up the oval space, after which the heads of the set screws were cut off. The metal filling the oil hole served as a retainer for the bearing, a new hole being drilled for the purpose of lubrication.

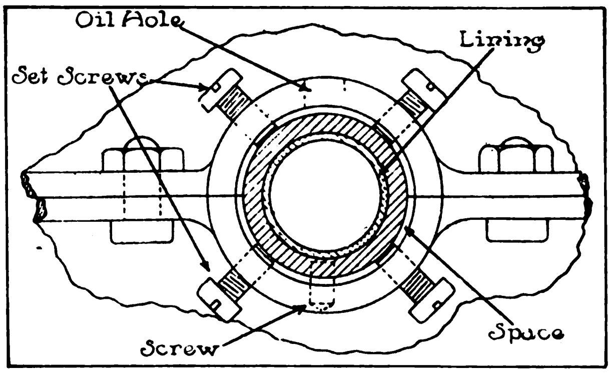


Fig. 3—Depicting How Loose Bearing of Gearbox Wore Casing, and Method of Repairing Damaged Part.

SIMMS MAGNETO AUTOMATIC CONTROL.

One of the features in the accessories displayed at the Olympia show, London, England, was the Simms automatic magneto controlling device, the object of which is to eliminate the use of any hand arrangement for regulating the firing point, thus rendering the advancing and retarding operations of the magneto entirely automatic.

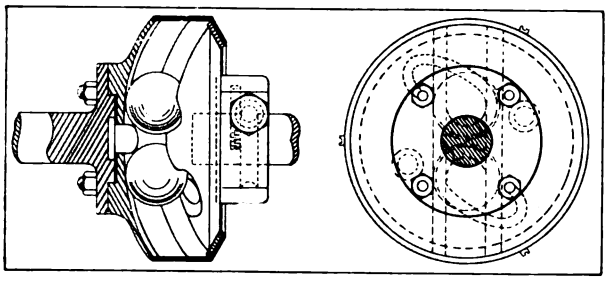


Fig. 4—Components of Simms Automatic Controlling Device for Magnetos.

This arrangement is very simple, and consists principally of a divided coupling, one-half of which is concave and the other convex, the latter being fitted to the armature shaft and the former to the driving member. On the surface of the convex portion are milled two helical slots, as shown at Fig. 4 at the right, and in the concave portion are two straight slots. Two loosely fitted balls work in these recesses, as depicted at the left. The faces of the latter are both held by means of two other balls, not shown, a sufficient distance apart to allow them to move freely. It is through the medium of the two larger members that the drive to the magneto is transmitted.

When the motor is not running, the two balls both converge towards the centre of the coupling as far as the recesses will allow them, but when the engine starts, and begins to gain in speed, centrifugal force causes the spheres to move outward, which owing to the curve of the milled recess, tends to alter, or automatically advance, the firing point. When the speed of the motor decreases, the reverse motion takes place, and the balls begin to travel toward the centre of the coupling.

THERMAL PROPERTIES OF GASOLINE AND AIR.

Many repairmen have a general idea of the value of increasing the compression and its effect upon greater thermo-dynamic efficiency, and the table given will serve to show the value of the various gas and air mixtures, the time required for thorough ignition, the explosive force in pounds a square inch, and the actual and theoretical temperatures at the time of combustion. The time given for ignition is at atmospheric pressure, the gas burning quicker as the compression is increased. Three atmospheres is 45 pounds a square inch cold air pressure, four atmospheres is 60 pounds, while five times normal air pressure of 14.7 pounds a square inch is nearly 75 pounds. The gas mixture which has the greatest heat value is the one that will give the most power. The explosive force increases as the compression becomes greater. It will also be noted that as the proportion of air in the mixture is increased the charge is made slower burning and has a lower heat value, except in the case of one part gasoline vapor to four parts air, where the proportion of gas is too great for satisfactory ignition. There is also considerable difference between the amount of heat actually obtained and that which theoretical consideration of the heating value of the gas mixture would indicate.

Gasoline vapor and air.	Time in secs. between ignition and highest pressure.	Explosive force in lbs. a sq. in. Compression in atmospheres.			Temperature of combustion in F. degrees.	
		3	4	5	Actual	Theory
1 to 13	0.28	156	208	260	1857	3542
1 to 11	0.18	183	244	305	2196	4010
1 to 9	0.13	234	312	390	2803	4806
1 to 7	0.07	261	348	435	3119	6001
1 to 5	0.05	270	360	450	3226	6854
1 to 4	0.07	240	320	400	2965	5517

PACKING BOX FOR VALVE GUIDES.

Where the valve stem guides are worn badly, a condition existing on old motors, considerable oil works from the crankcase, especially if the latter be not fitted with breathers to relieve the compression. This wear is due to the dirt that is attracted by the lubricant. Under such circumsances there is considerable loss of the latter and the engine always looks unclean.

The usual remedy is new bushings and tappets. A repair can be made, however, by fitting a packing device as shown at Fig. 5. Here the top of the guide has been turned for a distance of about .75 inch and a fine thread cut. The member is recessed as depicted. Four brass caps with internal threads are made, and slipped over the tappet, being fitted with a packing consisting of soft leather and spun yarn. When these are screwed up snugly the leaks are stopped. The filler should be oiled before insertion.

Simple Extension Drill—A very satisfactory extension drill may be made by taking a piece of iron or brass pipe, having an internal diameter equal to that of the hole to be drilled. With a flat pein hammer two dents are made directly opposite each other and about 1.5 inches from one end. Two flats are filed on the end of the drill, which is then driven in the pipe with a lead or copper hammer until the flats engage with those made in the walls of the pipe.

It is an excellent practise to have one or more chemical fire extinguishers in the garage to put out incipient blazes. The members should be so mounted that they may be grasped readily yet maintained in an upright position. The simplest method is to attach a hook to the wall or post as when mounted on an ordinary shelf the extinguisher is liable to be jarred from its position and become broken.

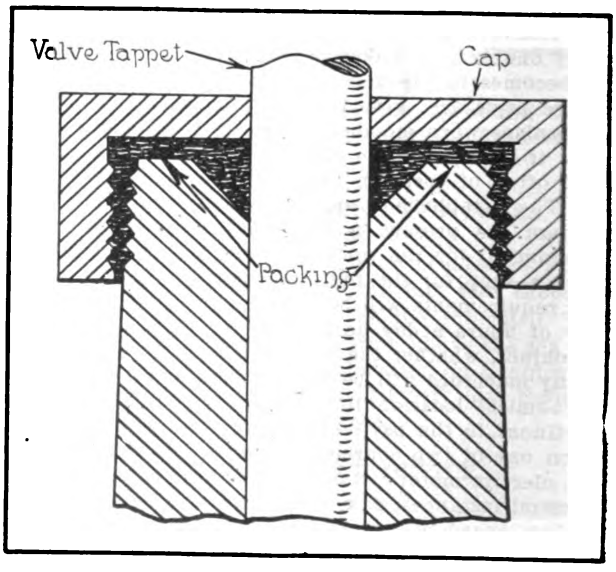


Fig. 5—Method of Preventing Oil from Leaking Past Worn Valve Stem Guides.

RECENT PATENTS of INTEREST

Youngs Fuel Lock.

One of the most practical methods of locking the motor car to prevent theft or its use by other than the owner or operator, is cutting off the supply of fuel to the carburetor. Fred Elliott Youngs, Detroit, has been granted a patent for a fuel locking device which may be operated from the seat, the securing mechanism being fitted to the dash. Interposed in the main line is a valve member which shuts off the supply of fuel. Extending from the device is a housing, carrying a rotating member which actuates the valve. The top of the housing is equipped with a locking device which prevents the valve being opened by others than those possessing the key.

Lutwyche Headlight.

The development of electric lighting equipments for the motor car has stimulated the efforts of inventors and a novel lamp has been patented by Edgar J. Lutwyche, Chicago. The lamp casing proper is open at one end and has a reduced neck at the opposite extremity. Within this member is fitted the electric lamp consisting of a parabola, the larger end of which is secured to the main lamp and cushioning means are also provided. The bulb extends horizontally from its socket and is equipped with the usual means for connecting the wires.

Hylton Hood Hinge.

Water tight hoods are essential on the motor car to prevent rain from reaching the power plant and affecting the operating of the ignition system. John C. Hylton, Chicago, has patented a hinge which differs from those of ordinary construction inasmuch as each of the two companion leaves have the whole of one edge rolled in cylindrical shape and these formations partially enclose each other. Each cylindrical edge being greater in extent than a semi-circle, the leaves are held in pivotal connection at any desired angle to each other. Each end is provided with notches adjacent to the ears and thimbles on the ends of the latter project into these notches.

McKiel Lamp Connector.

Recently, considerable attention has been paid to the development of automatic rotating headlights by inventors and a new design is noted in the device upon which James B. McKiel of Marshall, Tex., has secured a patent. The movement of the light in conjunction with that of the vehicle is obtained through an arm attached to the reach rod of the steering mechanism. The lamp is rotably mounted and is fitted with a spring arm member which is connected to the actuating member by a pivotal link.

Pieper Electrolytic Cell.

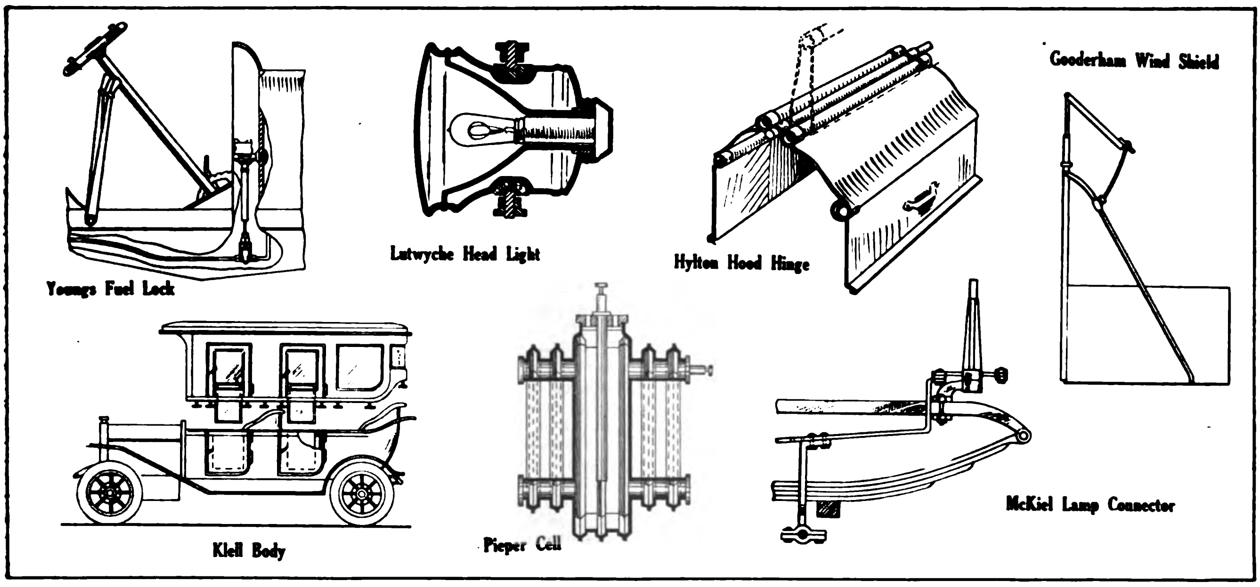
A patent has been granted to Oscar H. and Alphonse F. Pieper, Rochester, N. Y., for an electrolytic cell. It comprises a hollow chamber having radiating compartments with connecting passages at the top and bottom, also with the electrode chamber. The bottom of the latter is lower than that of the other members, and is designed to collect any and all sediment that may be present. The chambers and passageways are formed of an integral casting having apertures in alignment with the passageways and clean-out plugs are fitted in said apertures.

Gooderham Windshield.

A windshield of the adjustable type, also permitting the upper part to be displaced when desired, has been patented by Albert E. Gooderham, Toronto, Canada. It comprises an upper and lower sash so arranged to be moved into the same vertical plane, or into a plane at an inclination thereto, so as to present an opening between the top edge of the lower member and the bottom edge of the upper. The upper part is provided with foldable means as well as for holding. Its position is secured by stay rods carrying slidable brackets, and to these members are attached braces pivotally connected.

Kiell Convertible Body.

A convertible automobile body presenting interesting features, inasmuch as it combines the function of touring car and limousine, has been patented by Al-


Youngs Fuel Lock
Lutwyche Head Light
Hylton Hood Hinge
Gooderham Wind Shield
Kiell Body
Pieper Cell
McKiel Lamp Connector

Latest Ideas of Inventors Along Lines of Interest to the Manufacturer, Agent and Owner, Including Fuel Locking Device, Rotating Headlight, Convertible Body, Etc.

bert Kiell, West Park, O., assignor of one half to Henry Barnes of Cleveland, O. The regular open body is equipped with a laterally projecting border about its top. The closed body is fitted with barrel members, these registering with recesses in the other body, and having rotary locking devices for the purpose of fastening securely both bodies. It is claimed by the inventor that the upper body may be removed or replaced in a short time and that the design is such that it does not detract from the appearance of the vehicle.

OTHER PATENTS GONE TO ISSUE.

Lamp Support, James B. Eastes, Konowa, Okla. A support for automobile headlights connected with the steering reach rod, so that lamps are turned as the car turns.

Horn Bulb, H. W. Lester, assignor to the Post & Lester Company, Hartford, Conn. A horn bulb provided with a metal ferrule covering the neck and flaring back toward the body preventing undue distortion of the rubber and consequent cracking.

Tire Tool, Adam A. Long, Rochester, N. Y. A bar, one end of which fits around the wheel hub and other is formed as a handle, bears a plate which guides the tire into the rim. Placing the plate on the rim and the bead of the tire on the plate, it is only necessary to swing the bar around the wheel to force the tire into the rim.

Electric Horn, Solomon Rosofsky, Brooklyn, N. Y. A wheel rotated by a motor strikes against the arms connected to a diaphragm, the bearing of these arms on the wheel being adjustable from the outside, regulating the sound.

Motor, James F. Hopper, Sherman, Tex., assignor of one-half to Hamlet C. Smith. Motor in which compressed air is injected into explosion chamber to ignite charge.

Limousine Top, Oscar N. McCallister, Mount Vernon, Ind. A top adapted to transform the usual touring car into a limousine.

Top, Alexander Ritchie, Detroit. Has only one bow at each side of the seat, being held at the front and the rear by straps.

Hydrometer, Edward W. Smith, Philadelphia. A hydrometer for storage batteries consisting of a syringe containing the hydrometer proper, the nozzle of the syringe being closed by a block containing an S shaped passage which excludes air, so that the syringe full of fluid may be inspected where convenient.

Windshield, James E. Stevenson, Puyallup, Wash. A windshield adapted to fold on itself at the side of the car, the transparent part being of flexible material carried on rollers on the dash.

Whistle, Emmet P. Gray, Detroit. An exhaust whistle attached to the side of exhaust pipe, with which it connects by means of a valve, normally closed. The opened valve extends into the pipe, directing part of the gases into whistle.

Spark Plug, Luther H. Wattles, Providence, R. I., and Matie C. Messler, Pawtucket, R. I. A spark plug containing a piston actuated by the motor compression and revolving the armature of a generator to produce an electric current.

Nut Lock, Elmer L. Minnig, Harrisburg, Penn. Nut is provided with a pin bearing an eccentric pawl which engages with the threads of the projecting end of the bolt, preventing loosening of nut until pawl is thrown out of engagement with threads.

Indicator for Acetylene Generator, Joel E. Hill, Lexington, N. C. An indicator for acetylene gas generators, by means of which the amount of carbide unconsumed is shown.

Seat, Ludwig Wilkening, Hanover, Germany. A spare seat for automobiles, made of wire with a curved spring beneath the side member.

Control Lever, Alfred T. Sturf, Flint, Mich., assignor to Buick Motor Company. A control lever for fore door bodies, the sector being attached to the top of the door, inside. This lever is provided with a handle and is adapted to engage and manipulate other levers not so provided, beneath the sector.

Steering Rod, Jacob H. Stull, Fremont, O. A universal jointed steering rod which may be tilted in any direction and is provided with means for holding it in any determined position.

Air Pump, Frank C. Virtue, Toronto, Can. Has inlet valve at bottom and outlet valve to hose at top. The foot irons are adapted to fold along the pump cylinder.

Spring, Herbert Austin, Barnt Green, near Birmingham, England. A full elliptic spring, the middle of the upper member of which is pivotally attached to the frame while the inner end is linked to the pivot connection of the corresponding end of the lower member to the frame.

Spark Plug, Vincent G. Apple, Dayton, O. The ends of the centre electrode are fused intimately with the insulating material of the core, effectually closing the passage through which the electrode is inserted.

Motor, Harry Whidborne, Plymouth, and J. J. Lishman, Salcombe, England. A motor of the two-cycle type, with a two-diameter piston. The cylinders are arranged in pairs, the larger end of one piston compressing a charge for the explosion chamber of the other cylinder. The large end works in an annular chamber in two parts and compresses two independent charges of gas and air.

Oil Can Holder, Amos Hutton, Chicopee Falls, Mass. A bracket holding a bar which is provided with an aperture guarded by jaws which grip the spout of an oil can.

Motor, Robert McKee, Philadelphia. A reversible four-cycle motor, in which means are provided for advancing the lead of the cams when reversing and at the same time keeping the direction of revolution of the camshaft unchanged.

Windshield, Frederick Schimpfer, Union, N. J. A windshield in three parts, the lower one fixed, the middle one hinged to this, and the upper one pivoted to the frame.

Carburetor, Frederick Barthel, Detroit, assignor of one-half to F. E. Wadsworth. A carburetor for two-cycle engines, in which the needle valve opens directly into the cylinder. The crankcase compression is communicated to the gasoline in the device, forcing it into the cylinder at the same time that the air escapes through the port into the cylinder.

Spark Plug, Charles C. Eldridge and Edwin J. Beebe, Marshalltown, Ia. The main body of the shell of the plug is fitted with two extensions, these being so designed that the space between them and the central electrode may be altered as desired.

Lamp Attachment, Harry A. Lewis, Chicago. A hinged hood attachment for acetylene headlights projecting forward from the upper portion of the light and adapted to intercept the upwardly radiating rays from the source of light.

Wrench, Charles T. Melhorn, Amsbry, Penn. The shank of the wrench is provided with teeth which mesh with a pawl arrangement on the movable jaw of the tool and means are provided for engaging and disengaging the member.

Lamp Cover, William T. Phillips, Berkeley, Cal. Flexible covers in sections are pivotally mounted on the support of the lamp and these are so constructed that the sections meet for locking. When the use of the lamp is desired these covers fold compactly and by means of a flap are protected from foreign elements.

Fuel Filter, Joseph Remi Tourangeau, Windsor, Ontario, Can. The device comprises an upper and lower compartment separated by a perforated partition. The fuel is led to the lower chamber through a tube which is also perforated at a point below the partition. The lower chamber is provided with a petcock for draining off deposits of water and dirt.

Shock Absorber, Horace B. Stanton, Boston. The device comprises a cylinder, a piston rod, a main piston on the latter and two auxiliary pistons at each end of the main piston, and means for the additional members to slide freely through the main piston.

Grip Tread and Mud Shoe, Cortez V. Pugh, St. Louis, Mo., assignor of part to Edward Brockschmidt and others. It comprises a pair of endless chains on opposite sides of the wheel, having a plurality of chain grip treads each of which is provided with a base portion conforming to the tire. These mud shoes have a blade projecting outwardly.

Automobile Heater, Frank W. Dilks, Philadelphia, and Davis Reyam and Eugene E. duPont, Wilmington, Del., said Dilks assignor to said Reyam and said duPont. A casing is utilized to form a heating chamber and is provided with openings for the exhaust pipe, also tubes for air, as well as a hot air outlet and means for detachably connecting same.

Gearing, Joseph Dain, Ottumwa, Ia. A transmission device comprising a pair of discs which engage with a similar member, slidably connected to the crankshaft of the motor and operated by a lever. It is designed to secure a low speed and reverse only.

Automobile Starter, Wilbert B. Speice, Payne, O. A self-starting mechanism for internal combustion motors comprising a clutching device, a spring and two wheels and means for winding said spring and for throwing into and out of engagement the wheel actuating the crankshaft of the motor.

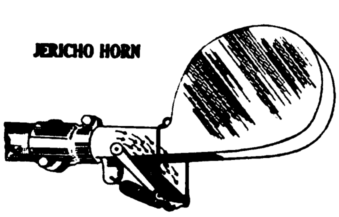
Tire Inflating Apparatus, Mason F. Stolberg, Toledo, O. A device for pumping up a tire by utilizing a friction wheel in contact with the revolving wheel of a motor car, said friction member actuating a plunger pump which is mounted upon a frame carrying the driven member.

Non-Freezing Water Device, Howard S. Campbell, Baltimore, Md., assignor of one-third to Jacob Zill and one-third to Percy Teixaira de Mattos, of the same city. A valve is incorporated in the circulation system of a motor and is fitted with an armature. An electro magnet is in proximity to the armature which is operated by a temperature actuated element. When a predetermined temperature is reached, the device automatically opens the valve and allows the water to drain out of the system.

NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS.

The Jericho Warning Signal is made by Randall-Faichney Company, Boston, and as the firm's slogan, "Warns without offense," would indicate, it produces a very mellow note of pleasing nature. The sound is brought forth from a section of a cylinder by the passage of the exhaust gases over a narrowed opening. The latter is controlled in width by an exterior gate, which is moved by a cable attached to one pedal. Pressing on this draws the closing member up and reduces the area of the passage to a small slot. As this is narrowed, the noise from the sound chamber gradually increases in volume and the tone steadily rises, until at the smallest aperture, the maximum warning signal issues. The sound box being a casting with rough interior, the resulting noise is mellowed in this manner as well as by the method of its production. At the forward end, a clamp allows of attaching to the extremity of the exhaust pipe in such manner as to disturb nothing else. The whole is simple, cannot get out of order, and may be attached by anyone with few tools. It is shown in the accompanying sketch.

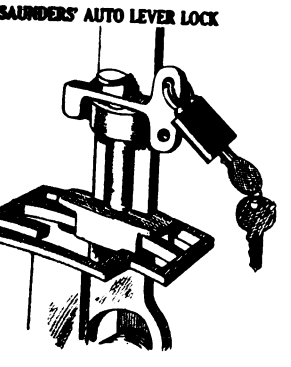
JERICHO HORN



★

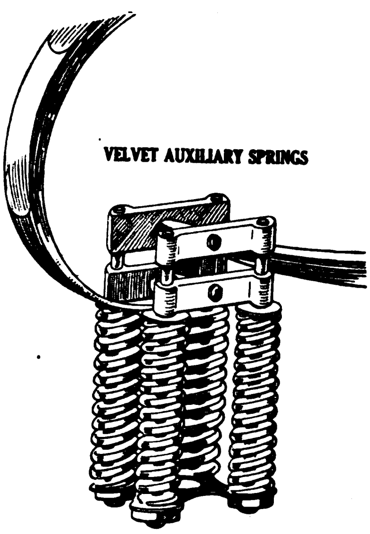
The Auto Lever Lock is an ingenious device for preventing the surreptitious use of the machine. This form fastens the speed operating or brake control lever, as desired. Usually the former is chosen; in fact, the maker recommends it. The base of the lock fits over the ordinary H quadrant, when this lever is in neutral, this being so shaped that after application the latter may not be moved. The base portion, however, could be removed rendering the fastening ineffective, hence a common padlock is provided to connect this firmly with the lever. To the latter, a clip with two ears must be fastened, each of these having a hole through it of sufficient diameter to accommodate a Yale lock. These two openings correspond with a pair of similar ones on the central part so that when the whole is in place the apertures register. The fitting of the padlock completes the operation, which is extremely simple and occupies but a few seconds. All of the metal parts are made very strong and durable, while duplicate keys are furnished by the maker, F. H. Kelsey & Co., Cleveland, O.

SAUNDERS' AUTO LEVER LOCK



★

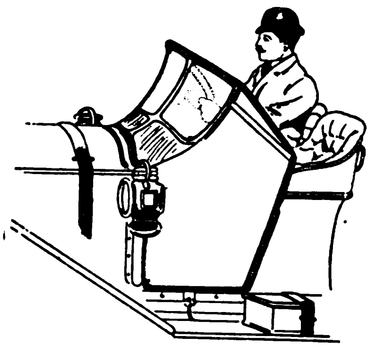
Velvet Auxiliary Springs are for the purpose of lessening the road shocks transmitted to the occupants of the automobile. As shown in cut, this product of the John W. Blackledge Manufacturing Company, Chicago, is attached at the ends of the lower part of a three-quarter semi-elliptic spring. With the platform type, the joint where the side member meets the rear cross portion is the point of attachment. While these are not called shock absorbers, that is their real function, although the maker claims to prevent broken springs, save tires and protect car and occupants. According to the nature of the springing into which they are introduced, the details of construction vary, although in general they consist of four coil members joined at the bottom by means of a plate which is connected with one vehicle spring. The tops are also united by a second plate, which is connected with the other half of the laminated member. In addition to through bolts which connect top and bottom of the spirals, there are guides for the prevention of side sway. The combination is supposed to make a car ride as if on velvet, hence the name.



VELVET AUXILIARY SPRINGS

★

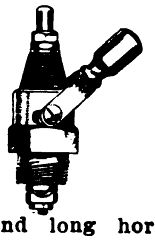
The Auto Windshield is one of the latest developments in the way of comfort and safety for the motorist. This has a curved shape, scientifically worked out, so that it deflects all air currents from the front, upward and thus harmlessly over the driver's head. In this construction, the protector may be cut off below the line of the operator's vision, thus making it possible to look over rather than through the transparent upper portion as in the ordinary case. It is made of fabric with celluloid panels, and supported upon brass fittings which attach to dash, floorboards, or both. The side curtains are detachable and need not be used in warm weather, while the entire device may be removed, rolled up and stored under the seat in less than 10 minutes. The use of celluloid does away with possible breakage, while the comfort and protection leave nothing to be desired. This accessory is made by the Auto Wind Shield Company, Cambridge, Mass.



AUTO WIND SHIELD

★

The Winestock Spark Plug, as shown herewith, is made in two forms; solid and quick detachable. The latter being the one shown will be described first. This has a single central member to which both terminals are attached. A two-armed lever is pivoted on this and forms the locking device as well as the lifting handle. The outer shell, which is screwed firmly into the cylinder, has a pair of vertical narrow and long horizontal slots. By fitting the pivoted lever in this, dropping down the upright part and then placing the level portion over this, the

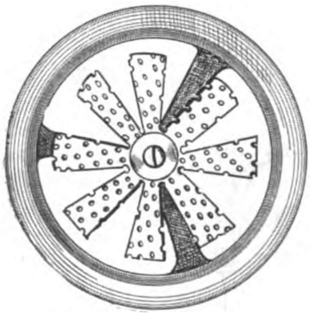


WINESTOCK SPARK PLUG

cone seat on the central electrode is jammed against that on the shell.

* * *

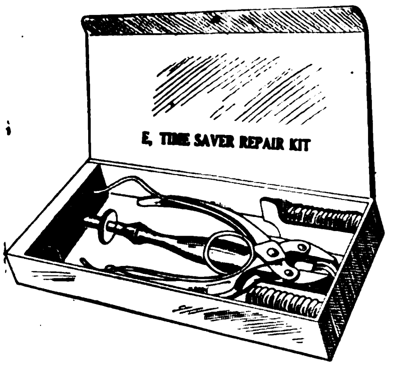
Gyrex the Mixer is a small whirling paddle wheel, to be placed in the inlet manifold above the carburetor, where its function is to revolve at a rapid rate, and thus increase the evenness of the mixture. In bringing about a more complete diffusion of the particles of air with the gaseous fuel, it produces a more homogenous charge in the cylinders, and in that way more regular power results from successive strokes. Besides, its use in the inlet pipe is said to reduce materially the amount of fuel needed for a given power or specified speed, in fact the maker, the Royal Equipment Company, Bridgeport, Conn., states that it gives an economy of 25 per cent. The device as seen in cut is described as a compact, nickel steel turbine, mounted on balls, encased in a brass shell.



GYREX MIXER

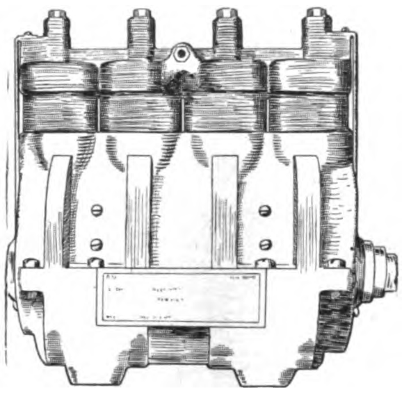
* * *

The Time-Saver Repair Kit is a new addition to the ordinary list of tools, which the motorist feels obliged to carry. This is depicted in the drawing and consists of a handsome black case, lettered in gold, the size of which is so small as to go in any tool box. In one compartment is located the wire spreader, while the others contain respectively: Screw rubber cutter, pair of Rand's patented pliers, and a dozen Time-Saver rubber plugs, an extra one of which is placed in the pliers, ready for use. The whole is for tire repair work, in which the new plug is a very important addition. This is constructed of solid rubber, having a pliable metal skeleton. When compressed it has 10 times the strength necessary to close puncture, requiring the use of a tool to compress it into position. There is no way in which the tire can be injured by it, as the metal is imbedded in solid rubber. Being used directly upon the tube without cement, the work of repair is much shortened and simplified. The kit is made and sold by the Auto Time-Saver Repair Kit Company, Boston.


E, TIME SAVER REPAIR KIT

* * *

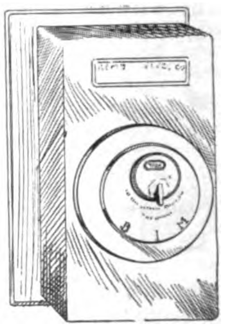
The Kellogg Air Pump is a four-cylinder mechanically actuated source of air pressure replacing the old back-breaking form. It is made by the Kellogg Manufacturing Company, Rochester, N. Y. As the sketch shows, in construction it follows closely along the lines of the ordinary gasoline engine, but on a much smaller scale. Some idea of this may be gained from a statement of its size; length nine inches, width four and height seven. Cylinders are 1.5 inches in diameter and the stroke 1.125 inches. The maker fixes the most advantageous speed as 400 revolutions a minute, at which it will deliver a pressure of 200 pounds a square inch.



KELLOGG FOUR-CYLINDER AIR PUMP

* * *

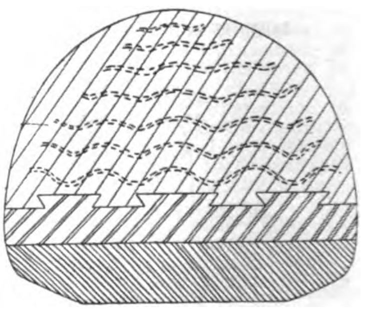
The Blackburn Lock Switch has been brought out by the Blackburn Specialty Company, 1132 Prospect avenue, Cleveland, O., and offers a means of locking the ignition circuit so as to prevent the operation of the car. The device is very simple, the idea being that of substituting for the usual ignition key and socket which is so easily manipulated, a Yale lock of the pin and tumbler type. The key of this lock acts as the ignition plug for turning the switch from "off" to "battery" or "magneto" or vice versa, and when it is removed the switch cannot be turned with any but the proper key. This gives as much security in locking the automobile as in locking the front door of the house. The switch cover cannot be removed even if unscrewed, until after the key has been inserted and turned to the releasing point. When the switch is mounted on a coil, it is impossible to short circuit the wiring.



Blackburn Lock Switch

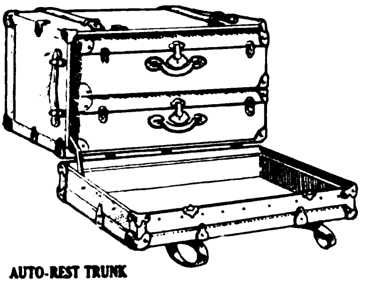
* * *

The Dow Tire is a new type of solid tire which has been invented by Alexander Dow, 104 West 42nd street, New York City, and has as its distinctive feature a number of layers of fabric embedded in the rubber. The idea of this construction is to prevent the tearing of the tire, and confine the loss of rubber strictly to what might be called legitimate wear. Rubber when enclosed offers great resistance to compression, and therefore the alteration of a tire under load is distortion. This free distorsion is permitted in the Dow tire by the fabric being corrugated, and as these corrugations run diagonally with the circumference of the tire, provision is made for both lateral and circumferential distorsion. Elasticity of the fabric along the crests of the corrugations is taken care of by laying the fabric with the diagonal of the weave in line with the crests.



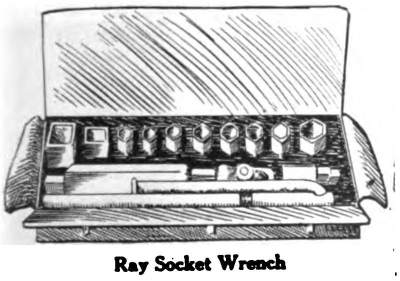
Dow Solid Tire

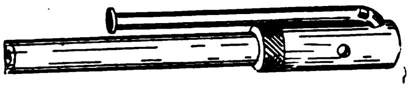
The Auto-Rest Trunk, as shown in sketch, possesses a number of new ideas and in convenience and strength, which the maker, the M. C. Lilley & Co., Columbus, O., feels should make it a popular accessory. This concern makes a specialty of automobile trunks, and as this new auto-rest is the latest addition to the line, it should possess more than usual merit. It is described as a portable restaurant, providing means for serving a hot dinner while on tour. As a secondary feature, by the addition of two suit cases, it can be changed immediately into a regular touring trunk. The exterior is of three-ply leather, covered with heavy enamelled duck, and has fibre bound edges and reinforced brass corners. Two 1.25-inch straps serve to fasten it on.


AUTO-REST TRUNK

★

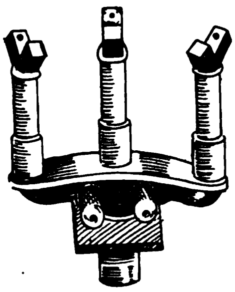
The Ray Socket Wrench is being manufactured by the Packer Auto Specialty Company, Chicago, and distributed by the Fulton-Grubb Company, 1146 South Michigan avenue. It is made in two sets, the smaller being illustrated. With the wrench comes a complete line of sockets made of pressed steel, cold drawn and case hardened, an assortment of screw drivers, a universal joint, permitting the use of the wrench at any angle up to 90 degrees, one long and two short extension bars, and a long socket for use on spark plugs, enabling their removal without cracking the porcelain. The wrench itself is of the ratchet type practically noiseless in operation, nickel plated and polished, and with the use of the various sockets and attachments it is possible to get into almost any place, no matter how difficult of access.


Ray Socket Wrench



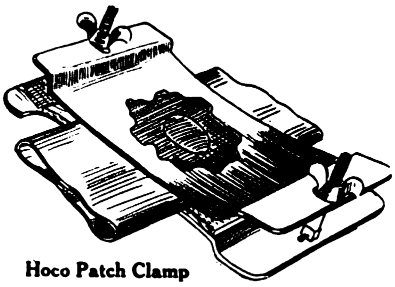
★

The Tri-Radiant Fixture is made by the Lenhart Manufacturing Company, 246 North Delaware avenue, Philadelphia, and is an attachment for acetylene lamps which enables three burners to be used. The fixture, as illustrated, bears the three burners on an arm, the two outside ones turned so as to present the broad surface of the flame to the surface of the mirror or reflector opposite it. The result of this construction is that a broad beam of light is projected from each side of the lamp, the illumination spreading wider than when only one central burner is employed. The light to the extreme right and left is as strong as at the centre, with no intermediate lines of darkness, and the illumination is held to be highly satisfactory. The broadness of the burner insures that all parts of the road are covered, preventing accidents in passing cars or in running into them at curves. The light covers a greater angle than one in which a car can be turned. The fixture is substantially made of brass, nicely finished and nickel plated throughout, and furnished with the best hexagon burners. These burners have a much smaller capacity than those ordinarily used, thereby cutting down the gas consumption. In fact the effect of the fixture is virtually to divert the gas which is usually sent to the central burner to the three burners and thus spread its illumination wider. Either one or both of the side burners may be turned off at will.


Tri-Radiant Fixture

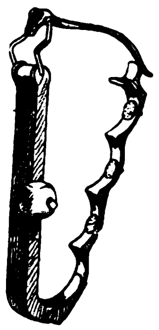
★

The Hoco Inner Tube Patch Clamp will be appreciated by motorists who have made repairs on inner tubes. It is made by Hoeft & Co., Chicago, and will fit any tube. In repairing a tube with a patch, pressure on both is desirable, as it spreads the cement and aids the vulcanizing agent thoroughly to bind and incorporate the two surfaces, making them homogeneous. Motorists on the road, realizing this sometimes adopt ingenious expedients to secure this pressure, as for instance, sitting on the patch, placing a board and a miscellaneous collection of tools on top, etc. With the Hoco patch clamp this is unnecessary. Thumb screws draw together the two plates between which the tube is held, applying a firm pressure through the spring metal of which the back is constructed. The device will take any tube, and is made of steel, nickel plated. The weight is 24 ounces.


Hoco Patch Clamp

★

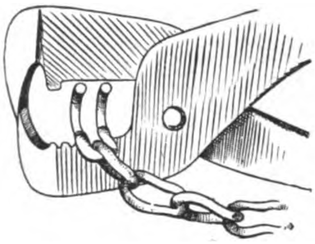
The Bair Top Holder is being placed on the market by the Auto Specialties Manufacturing Company of Chicago and is a device for holding the top bows rigidly together when the top is down. This prevents rattling and undue distortion of the bows, and is such an advantage that it is already standard equipment on a number of cars. It is made in two sections, hinged together at the bottom so that when the clamp at the upper end is loosened the holder opens, and allows the bows to be raised. The small hand lever attached to the clamp enables it to be manipulated easily and without delay. One side of the device is provided with a clamp and set screw for attaching to the side of the car. The hinged section which is provided with sockets to hold the bows is so made of steel covered with leather that the bow is not


Bair Top Holder

scratched or marred, and the leather seam in the covered bows is not injured.

★

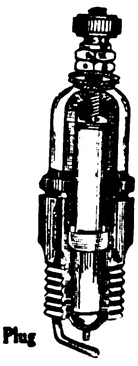
The Necessity Tire Chain Tool is manufactured by J. N. Macdonald & Co., Wethersfield, Conn., and is being distributed by T. F. Russell & Co., of Boston. As its name implies, this is a device for repairing tire chains. The jaws are of a special construction, and by means of the instrument the hooked ends of the chain links may be forced apart easily, or compressed just as readily. Those who have tried to repair tire chains with pliers, chisels, screw drivers, and other tools not at all adapted to manipulate the heavy wire links of which the chain is made, will thoroughly appreciate this tool, which renders repairs easy and enables them to be effected in a short time.



Necessity Tire Chain Tool

★

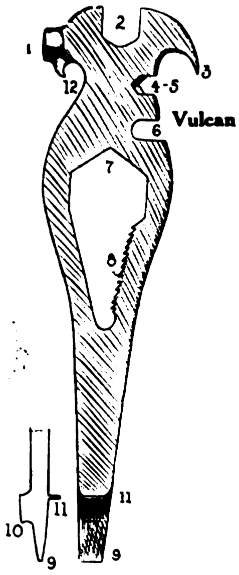
The Sturdy Spark Plug is made by the Sturdy Manufacturing Company, 2637 Michigan avenue, Chicago, and is marketed in sets for four and six-cylinder cars, the set consisting of the requisite number of plugs with an extra one in a leather case for tool box. A feature of the construction is that the main porcelain is suspended against the bushing in such manner as to permit the upper spring washers to take up the contraction and expansion caused by the cooling and heating of the engine. In cleaning there are practically only two units, as the bushing unscrews from the shell, and in replacing it is drawn down to the shoulder with no possibility of cracking the porcelain. The plug is guaranteed against everything but abuse.



Sturdy Spark Plug

★

The Vulcan Auto Tool is being placed on the market by J. H. Williams & Co., Brooklyn, N. Y., and is a combination tool which should be of especial value to automobilists. It is drop forged and tempered, and in its canvas cover forms a handy hip pocket companion, as it is not bulky or unduly heavy. The various parts are used as follows: 1, hammer; 2, tire lug wrench; 3, cotter pin puller; 4, gas tank wrench; 5, insulation scraper; 6, air tank wrench; 7, spark plug wrench; 8, alligator wrench; 9, 10, 11, cotter pin spreader and three screw drivers; 12, bottle opener.



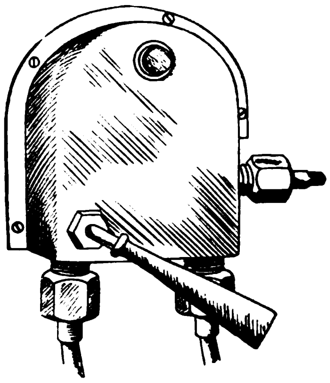
Vulcan Auto Tool

★

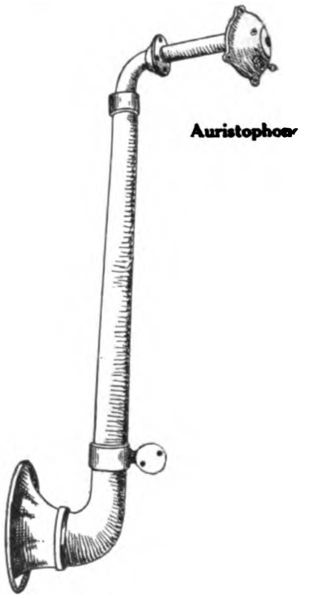
The Disco Lighter is made by the manufacturer of the well known Disco self-starter, the Ignition Starter Company, Detroit. This ensures that it possesses the merits of the starter, and will be reliable in action. It is a system for igniting the gas headlights of a car from the seat, and consists of a dash controller, piping, single unit vibrating coil, wire, burners with spark gaps and all fittings. The controller is illustrated, and consists of a neat and highly polished bronze member which is screwed to the dash. Turning the handle of the controller to the left opens the valve and sends the gas to the lamps, while a pressure on the button at the top of the controller sends the current to the coil and produces sparks at the points of the burners, igniting the gas. The maximum flow of gas through the controller is regulated by a needle valve, preventing undue consumption of acetylene, and if desired the handle may be partly closed in cities to dim the lights.

★

The Auristophone is an electric speaking annunciator, made specially for automobiles by the H. G. Pape Electric & Manufacturing Company, Buffalo. It is similar in construction to the electric announcer in use in the large railway terminals, but is smaller and not so loud. It is adapted to be placed beside the chauffeur of a limousine car, with the transmitter attached to a cable in the inside of the machine. The convenience of this will be appreciated by those who have tried to make a chauffer understand sign language through the glass of the limousine partition or words shouted through an ordinary speaking tube. The apparatus is in effect a powerful telephone, and the receiver at the chauffeur's side repeats distinctly the words spoken into the small watch case transmitter. The wiring is simple, and the system requires only a six-volt storage battery or dry cells.

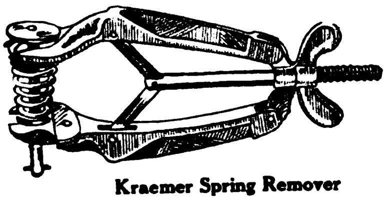


Disco Lighter



Auristophone

The Kraemer Spring Remover is made by the United States Compass Company, Cedarburg, Wis., and is a simple tool for releasing valve springs. The construction and method of operation is easily understood from examination of the illustration. The jaw is adjustable and may be set in a few seconds to fit any size motor, large or small. When the tool is in place with the two jaws at opposite ends of the spring, turning the thumb screw on its threaded rod draws the jaws together and thus compresses the spring, enabling the valve and then the spring to be removed. The spring is held compressed by the device, enabling both hands to be used in removing the valve. It is light in weight, compact in size, and reasonable in price.


Kraemer Spring Remover

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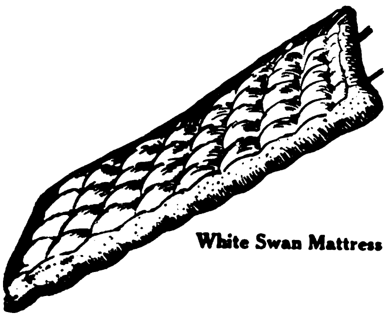
The White Swan Camp Mattress is made by the T. B. Burnett Company, Dallas, Tex., and should be of much service to motorists during the coming touring season, as it affords the comfort of a bed combined with portableness. It is made with heavy waterproof duck sides and bottom, so that it does not absorb moisture, or become cold and uncomfortable. It may be rolled up into a neat compact water tight bundle that can be carried conveniently in the automobile, a canvas bag being provided for this purpose. It is built up of 1400 layers of cotton felt, made from long staple Texas cotton, and is sterilized so as to be free from danger of disease. It comes in standard length of 6.5 feet and varying widths, weighing up to 25 pounds.


White Swan Mattress

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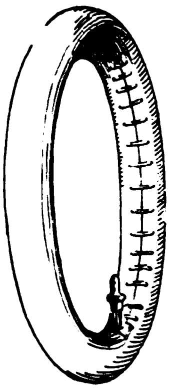
The Brownie Liner, made by the States Manufacturing Company, 1029-35 West Adams street, Chicago, will be appreciated by motorists who have had experience with punctures and blow-outs. As its name indicates, it is a liner to go between the tire casing and the inner tube. It is claimed that it will prevent 90 per cent. of the punctures and all of the blowouts, thus enabling new tires to make 10,000 miles. It consists of what is virtually an extra casing of very tough fabric which is neatly laced around the inner tube. The fabric is almost impenetrable, it being practically impossible to drive a nail through it when attached to an inner tube.


Brownie Inner Liner

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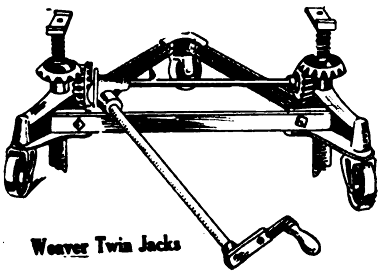
Weaver Twin Jacks are made by the Weaver Manufacturing Company, Springfield, Ill., and are a combination of lifting jack, turntable, truck and tire rest. As may be seen, the device consists of a triangular wheeled frame supporting two jack members, both operated by a crank through bevel gears. By it the front or rear axle of a car may be raised clear at one operation, and the car pushed where desired on the jack wheels.


Weaver Twin Jacks

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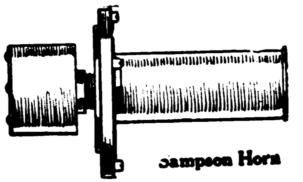
The Sampson Horn is a new style of this well known product of the American Electric Company, State and 64th streets, Chicago. It is of the torpedo type, and is designated No. 4, with a straight cylindrical projector of spun brass. It is an electrical horn, and requires little current, being operated on four dry cells or a six-volt storage battery. The magnets are large and powerful, wound to a high resistance with enameled wire and therefore require a minimum of current. Sparking is reduced as low as possible and the mechanism is enclosed in a neat enameled iron case. This case is the same in all the horns, the projectors being interchangeable on it. Six types of projector or horn may be had.


Sampson Horn

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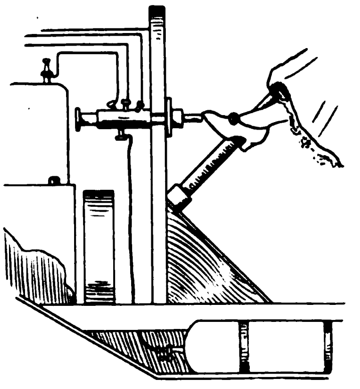
The Rekar Automatic Starter is made by the Rekar Automatic Starter Company, Sixth and Market streets, San Francisco, and provides means whereby a charge of acetylene gas is introduced into the motor cylinders and then fired, to start the motor. The starter consists of a controller which is attached to the dash, from which piping leads the gas to the cylinders. Pushing the rod on the controller admits the gas to the cylinders and affords a mixture to be exploded by the usual spark.


Rekar Starter

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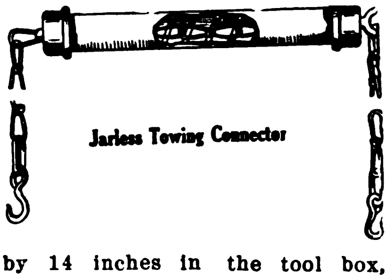
The Jarless Towing Connector will be appreciated by those who have towed a car or have been towed, and have experienced the jars and jolts to which the machines are subjected in starting. A heavy spring takes up and absorbs the jerk, acting as a shock absorber and turning the quick pull into a slower and easier one. It takes up a space of four by 14 inches in the tool box, so that it is convenient to carry. It is made by the Jarless Auto Towing Device Company, Cleveland, O.


Jarless Towing Connector

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Motor Knocks.

(92)—I am having trouble with my ———— motor. I cannot open the throttle wide without getting a knock although the spark may be well retarded. With a slight opening of the throttle I can advance the spark to its utmost without the engine knocking. The timing gears have been removed once by an expert from the factory. Can you not locate the trouble for me?

N. H. HARRISON.

Macon, Miss., Aug. 8.

It may be possible that the car is being operated with too rich a mixture and this may be determined by noting the odor of the exhaust as it leaves the muffler. If the mixture be correct it will be well to check the ignition timing and note the position of the piston. It is possible that in replacing the gears the factory expert may have set them a trifle too early.

The position of the piston may be checked by inserting a rod or bicycle spoke through the opening of the priming cock, and with the switch off, turning the motor until the cylinder is compressing. A further movement of the starting crank will cause the rod to rise and when the latter stops, it will denote the top of the stroke or dead centre.

When the switch is thrown on the coil should buzz and a spark be noted at the gap of plug if the motor be timed at dead centre. The operation may be facilitated by removing a plug and placing it on the top of the cylinder as is done in testing a plug.

When a spark does not materialize, the motor should be turned slightly so as to start the piston down on the firing stroke. It should be moved but little and at the same time it should be noted whether a spark appears at the plug. If timed correctly one should be seen when the piston has begun its downward movement.

If not, the piston should be brought back to dead centre again and the motor turned so that the flywheel moves in the direction opposite to that in operation. By moving the member slowly until the piston has begun to descend, if the timing be early it will be indicated by a spark at the plug. If this condition exists it should be corrected. With the spark lever fully retarded the spark should occur when the piston begins its downward movement or firing stroke. The amount of this lead varies according to the design of the motor, etc., but the writer favors about .5 inch which provides a safe lead for cranking and this retard can be taken care of by advancing the spark lever.

Mixture of Gasoline and Oil.

(93)—Will you please explain to me if it is feasible to mix lubricating oil for cylinders and pistons with the fuel, thus dispensing with a lubricator, its driving means, and considerable bother as well? Do you think this a good scheme, and if so in what proportion should the two be mixed?

R. De V. KUHN.

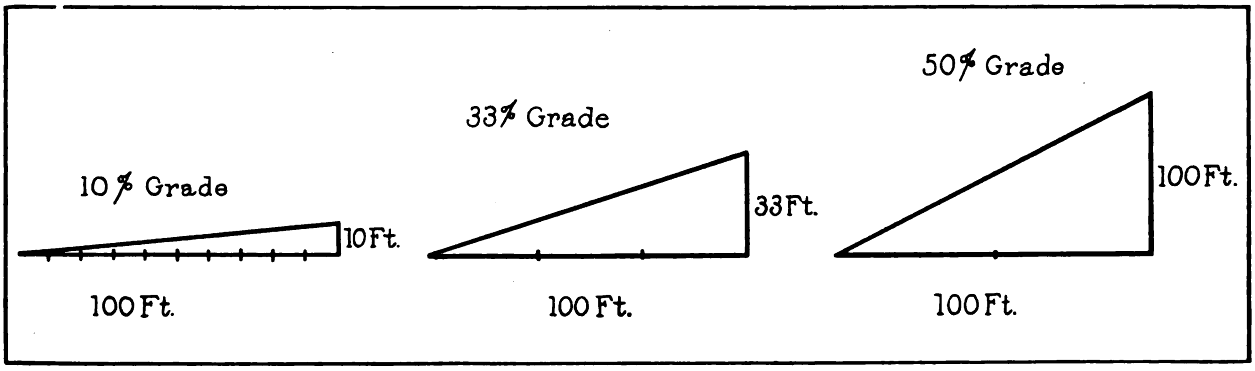
Westerly, R. I., Aug. 3.

This is a practise which often has been advocated for use on four-cycle engines but has never been tried with any particular success. With two-cycle engines, especially for marine work, this method has been utilized to a large extent, and is still in vogue. The difference in the action of the two forms makes this possible. In the two-cycle, particularly with base compression, much of the oil is left in the crankcase during the compression stroke, where it acts as a lubricant for the crankshaft bearings, connecting rod, and other parts.

The extraction of a large amount here through gravity, centrifugal force at the many bends, etc., leaves a very small quantity which is actually carried into the cylinder. The action of this form is so coarse, so wasteful of fuel, and generally results in such a large amount of smoke from the exhaust that a little more odor, some additional smoke and a slightly poorer result with oil substituted for gasoline, hardly would be noted.

For good, reliable lubrication, however, this hit-or-miss method can not be recommended. It is practically impossible that the cylinder or piston walls shall be oiled effectively or evenly, while the excessive use of the oil surely will result in extra carbonization. If the walls be not coated with an even film of the unctuous material, heating at some uncovered spot is sure to develop.

When the mixing method is employed, the general proportion of the two liquids is about one of oil to 20 of fuel. This would be one quart of lubricant to every five gallons of gasoline. Those wishing to do so can, however, use more or less than this quantity to suit any specific case.



Sketch of Various Grades, Presenting the Relation of Base to Altitude and Rise of the Latter in a Given Length.

Percentage of Grades.

(94)—Will you please explain to me what is meant by the per cent. of various grades? Is a 10 per cent. grade one which rises one-tenth of the possible total (360 degrees) or how does it rise? I have often talked with other motorists about this, and there seems to be considerable misunderstanding about it.

P. W. HAMEL.

Bridgeport, Conn., August 2.

The per cent. of a grade is the amount of its rise in 100 feet and has nothing whatever to do with the angle of the ascent. Thus a rise of 10 feet in 100 is one-tenth or 10 per cent. Similarly, 33.3 feet in 100 would be one-third or 33.3 per cent. In the accompanying figure, these two grades and another of 50 per cent. are shown graphically, bringing out the relation of the vertical rise to the horizontal length. To make this clear, the base lines have been divided into 10 parts in the first case, three in the second and two in the third.

When reference is made to a grade by means of angles, the included angle between the horizontal and the slope is meant. In the three instances shown, this would be respectively: Five degrees 45 minutes, 18 degrees 15 minutes, and 26 degrees 35 minutes. About

30 degrees slope, or 57.8 feet in 100, is the limit on which the traction is superior to gravity, hence it is the greatest which any self-propelled machine can traverse.

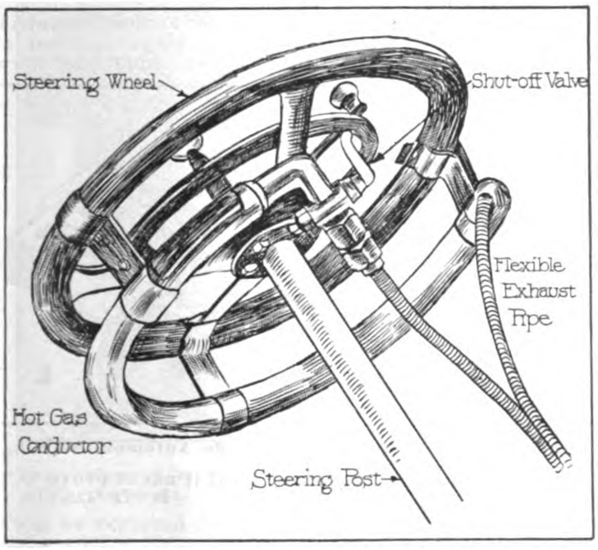
Hand Warmer for Winter Driving.

(95)—What material should one add to the water in the acetylene generator to prevent it from freezing and at the same time have no chemical effect that will alter the quality of the gas produced? Would common salt be suitable? Is there any simple hand warmer that can be applied to the steering wheel of a motor car among the standard accessories marketed by dealers?

JEROME K. GREEN.

Burlington, Vt., Aug. 2.

One may add grain or denatured alcohol up to about 25 per cent. to water for the generator without interfering with the lighting effect, this reducing the freezing point to about 10 degrees above zero. Wood alcohol is better, 30 per cent. added to the water bringing the freezing point to about zero. Calcium chloride or sodium chloride (common salt) should not be used because the salt will change the color of the flame, making it yellow instead of white. The best method is to make a hood of padded cloth, something like a cover used to keep the coffee pot on the breakfast table warm, to fit over the generator. As there is considerable heat evolved from the chemical action producing the gas, the generator will be warm enough to keep the water or alcohol and water solution from freezing at temperatures considerably less than zero.



Showing Application of Simple Hand Warmer to Steering Wheel.

The writer does not know of any hand warmer marketed in this country, but the simple fitting shown in cut is marketed in England, and as it is easily made, there should be no difficulty in applying it to conditions obtaining on this side. The device consists of a tube fixed to the periphery of the steering wheel, having sufficient space between it and the wheel so the hand can be placed between the wheel rim and the pipe. The clamps securing it to the wheel are sufficiently strong to enable one to grasp the heated pipe for steering if necessary. Special flexible tubes lead to the exhaust pipe, suitable shut-off valves being provided, and a portion of the hot gases are passed through the tube to heat it. As only a portion of the gas is by-passed through the heater pipe, the free passage of the main column of inert gas to the muffler is not interfered with. The warmer can be fitted above the wheel if desired where the wheel is normally too low for the comfort of the driver. It would seem possible to pass part of the water from the cylinder jackets through the pipe to heat it instead of the exhaust gases, if desired.

Pressure of Compression.

(96)—Please instruct me as to the pressure of compression of a 5.5-inch bore and 5.75-inch stroke opposed engine at say 45 revolutions. Please send rule for figuring pressure if it is convenient. W. R. HIGGINS.

Mott, N. D., July 17.

The pressure at a speed of 45 revolutions under normal conditions would be about 70 pounds. In the case of higher speed, an addition of from 15 to 20 per cent. may be made as it is expected that some loss of compression will be caused by the piston rings at slower speed. The rule for figuring pressure is as follows: Find ratio of combustion chamber to cylinder capacity. Ordinarily this is one to five. Then multiply the atmospheric pressure 14.7 by the ratio 5 which gives absolute pressure. If the gauge pressure be desired, deduct from the product 14.7.

Soldering Aluminum Gearcase.

(97)—Will you kindly advise me whether an aluminum transmission case can be soldered? The case in question has a piece about two inches square partially broken out. A small crack on either side permits the grease to escape, but the rest of the section is tight.

E. H. DEWEY.

Great Barrington, Mass., Aug. 5.

Various aluminum solders are produced that will work satisfactorily if properly handled. Whether they can be used in your transmission case depends upon the alloy of which it is composed, which should be very nearly the same as that of the solder used to obtain the best results. A mechanical patch can be applied, this consisting of a packing of thin sheet cork or cardboard placed over the injured portion and held in place by a plate about three inches square riveted or screwed to the case. The most workmanlike way of repairing the case would be to have it welded by the autogenous process. If the cracks are not large, it is sometimes possible to seal them with a paste made from litharge and glycerine, which is forced into the crack and allowed to harden. Heating the case with a torch before the litharge paste is applied will facilitate the hardening process.

Testing Spark Coils.

(98)—Will you please let me know how a person can tell when a spark coil is broken down? And when one suspects this is the case, how can it be tested and proven? F. L. L.

North Attleboro, Mass., July 27.

If on coupling the defective unit to a set of cells one does not get any movement of the vibrator it is a sign that a wire in the primary circuit is broken, probably where a conductor fastens to the vibrator bridge or the armature block, or that the primary coil is defective. It is assumed that the vibrator is mechanically right and the spark points and armature spring tension properly adjusted. If there is a vibrator movement, but a very brilliant spark between the contact points, and a weak secondary spark it is a positive indication of a punctured condenser. If the vibrator functions properly, but there is no secondary spark, one should look for a broken secondary wire, usually at the high-tension terminal. These wires are often twisted off when the terminal nuts are screwed up with a pair of pliers so that the entire terminal turns in the coil box. If the secondary wire connection is as it should be, then one should suspect the secondary winding, which is probably burned out. A new condenser or secondary winding can only be inserted at the factory where the coil was made, though the local electrician may find and repair broken internal connections.

Full Floating Rear Axle.

(99)—Kindly answer through your columns if there is more power delivered to the rear wheels of an automobile through the full floating rear axle than through the semi-floating type. I have heard many comments on this subject, some claiming that the full floating axle takes off considerable friction and results in more power at the driving wheels. C. H. S.

Bridgeport, Conn., July 13.

With the full floating type there is slightly less friction and consequently more energy is delivered to the driving wheels. The difference is very small, however. Both the semi and full floating designs are utilized by leading manufacturers of motor cars.

One Way Tires Are Injured.

(100)—Will you please tell me what may be the trouble with my car? I have trouble continuously with the tread of my tires showing deep cuts and signs of very hard wear, yet I never run my machine in car tracks or over anything which might cut them in this manner. It has puzzled me for a long time, as well as several of my friends to whom I have appealed. After I have put on new rear tires and run about 400 or 500 miles these deep gashes begin to appear on the treads of the new tires. What do you think is the trouble?

V. W. TALLMADGE.

Brockton, Mass., Aug. 7.

From the facts given and without seeing the car, it is a matter of conjecture what really is the matter. The fender clears the tires more than the permissible depression of the springs, but projecting below it are bolts which come down several inches. This brings the end of the bolts down to a place where a very heavy load will throw them into the tire. After that every jounce, every bump crossed or every movement of the car body will drive the end of the bolt into the tire. As these are stationary, while the wheels are revolving, it requires but a short time to dig up the whole surface of the tire.

Examine the bolts on your fenders, directly over the tires, and you will doubtless find one or two which are too long, and may be cut off close up to the fender. This will without a doubt remedy your trouble, which is both bothersome and expensive.

Calibrated Carburetors.

(101)—Will you please explain to me what is meant by a calibrated carburetor and what it is used for, as well as in what manner it is superior to the usual type? Are many of them made in this country?

De VOLSEN WOOD.

Pittsfield, Mass., Aug. 8.

A calibrated carburetor is simply one which is so constructed as to measure the fuel; that is, the size of the various openings through which the liquid flows is such that a certain amount must always pass when they are in use. Similarly with the amount of air entering: The arrangement is such that this will vary in a constant relation to the speed of the engine. This construction obtains in a number of devices which are regularly sold for the improvement of vaporization, as well as on the carburetors of a number of car makers, producing their own instruments.

Causes of Backfiring.

(102)—Will you please advise me as to the cause of the backfire from a carburetor when all valves are too tight? A weak mixture causes it, but why? I would also like to know the reason for the noise of a carburetor knock. It is not an advanced spark pound, with which I am familiar. With my car, a weak mixture or one perfectly suited for running on the level will cause a pronounced knock in sand, on a hill, or in other cases of a hard pull, and also with a quick opening of the throttle, when the spark is nearly "off"; all this on an engine which is timed very slow. I will appreciate your advice.

A. H. S.

Toronto, Can., July 16.

A weak mixture backfires for one or two reasons; either it is not ignited sufficiently early to permit of complete combustion or else the mixture is so streaked or stratified that the spark runs back through it and the open valve to the carburetor. In the former case, two results may be obtained; a continuous burning which is carried right through the exhaust and muffler, some of these burning gases there bringing about an explosion of the next charge carried through in the same manner. The second result will be a popping noise in the vaporizer.

It is agreed by scientists that the air and gas furnished an automobile cylinder are stratified, being composed of a layer of comparatively rich gasoline vapor, then one of pure air, then possibly another of mixed air and gas, the whole process then being repeated.

If the firing back be very sharp and positive, it may mean that the ignition is too early, causing the actual explosion in the inlet manifold, instead of within the combustion chamber. A third possibility is clogging of the fuel pipe to the carburetor or from it to the cylinders, so that little or no gas flows in. In that instance, there is nothing to ignite, and the spark runs back through the open valve to the fuel.

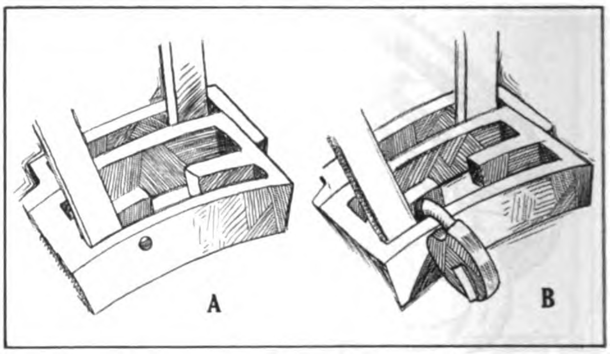
A quick opening of throttle will cause a knock in any but a new engine, the change in fuel flow being more rapid than that to which the motor can accommodate itself. The same is sometimes caused by the reverse operation; that is, when running on a very rich mixture, a rapid closing down to a very weak one will produce a marked pounding.

Making a Simple Car Lock.

(103)—Will you please give in the columns of your valuable magazine a method of making at small expense and not too much work a simple but effective form of lock to prevent the use of the car by anyone except the owner. Several states now require these and not all owners wish to buy an expensive and complicated form, no matter how efficient or convenient it might prove to be.

R. L. DAVIS.

Jersey City, N. J., Aug. 5.



Construction of Simple, Homemade Automobile Lock.

A very simple method of locking the automobile and one that anyone can devise in a very few minutes, with a minimum of expense, is presented in the accompanying sketch. To go about this: First, buy a small lock with a round bar of considerable length and not very large diameter. Next, borrow a bit and brace with a drill for steel of a size just a little larger than that of the lock bar. For instance, if the bar is .25, a G drill (.261) would be about right, such drills being known by letters.

Throw the gear shifting lever back into the reverse position, which will usually be at the back of the quadrant and either inside or outside. If the latter, the work is simple, but in the former case, it will be a trifle more bothersome. Fasten this lever back as tightly as possible and with the bit bore a hole through the quadrant bar close to the top, so that the side of the drill will just pass the front edge of the lever as fastened back. This will be as shown in A. When the car is not in use, throw into reverse gear, push the lever back as far as possible, slip the padlock into the hole in the quadrant bar and clasp it as shown at B of the drawing. This locks the machine against any but reverse movement, and while it would not prevent operation in that direction, it would work against its theft or use during daylight, as such a proceeding, running a car along the street backward, would excite unusual comment and call for investigation by the first policeman passed.

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"FAST LIMITED" AUTOSUIT.

The driver or the man who cares for his own car no doubt has had such experience as will cause him to appreciate any form of practical protection for his clothing while working about his machine, and because of the possibility of being compelled to make a repair or adjustment at any time, either on the road or in the garage, it is desirable for every man who tours to provide what will adequately shield his garments from soil. The old dust coat may be used, but every motorist knows the annoyance of the loose sleeves and shirt of the duster, which will either work up the arms or catch on the mechanism and expose the cuffs and coat sleeves, or will not effectually prevent the trousers coming in contact with dusty or oily parts. If it is necessary to work under the car the coat is in every way insufficient, and the overall and jumper will always separate at the waist when the wearer is writhing about on his back and cause his clothing to soil from the road dust or the garage floor.

The "Fast Limited" Autosuit.

The "Fast Limited" autosuit, made by the Detroit Overall Company, Detroit, is a one-piece garment of heavy pin check denim that may be slipped on over a suit and buttoned snugly, so that the motorist is protected fully, no matter what may be the work. It is closed tightly at the collar and wrists, and being of light weight, makes for decided comfort. There are four pockets in which tools may be carried. It is made with the deep continuous side and relieves the shoulders from the strain of the suspenders and in any position it is a complete protection. When it becomes soiled it may be washed and will be restored to its original appearance. It may be rolled and carried in any convenient place.

BARNES RESIGNS TWO OFFICES.

Claire L. Barnes resigned as third vice president and a member of the board of directors at a recent meeting of the board of directors of the Motor & Accessory Manufacturers in New York City. William H. Crosby was elected as a member of the board of directors, to fill the unexpired term of Mr. Barnes, whose office will continue until January, 1914. F. C. Billings, already a member of the board, was elected as third vice president, to fill the unexpired term of Mr. Barnes, which office will continue until January, 1913. The following concerns were elected to membership: Hood Rubber Company, Boston, Mass.; the Lefever Arms Company, Syracuse, N. Y.; the American Hardware Corporation, New Britain, Conn.

GASOLINE PRICES RAISED.

The fifth advance in the price of gasoline to garages in New York City within a period of six months was made recently, and it is believed this is only a forerunner of a general increase all over the country. The advance just made was one cent a gallon, and brings the price up to 15 cents.

ILLINOIS CENSUS FIGURES.

During the five years, from 1904 to 1909, the automobile industry in Illinois shows a remarkable gain, according to the report of the 13th census recently issued by Director E. Dana Durand. The establishments increased from 12 to 65, and the value of the product from $357,000 to $7,154,000. The number of people employed in 1904 was 167 and in 1909, 2382. The following tables give comparative figures that show the growth:

State of Illinois.

	1904.	1909.
Number of establishments	12	65
Persons engaged	192	2,804
Proprietors	8	41
Salaried employees	17	381
Wage earners	167	2,382
Primary horsepower	136	1,786
Capital invested	$401,000	$4,084,000
Salaries paid	28,000	426,000
Wages paid	107,000	1,653,000
Cost of materials	112,000	3,979,000
Value of products	357,000	7,154,000
Value added by manufacture	245,000	3,175,000

City of Chicago.

Number of establishments	11	41
Persons engaged	190	1,725
Proprietors	7	17
Salaried employees	17	248
Wage earners	166	1,460
Primary horsepower	....	734
Capital invested	$399,000	$2,094,000
Salaries paid	28,000	305,000
Wages paid	106,000	1,131,000
Cost of materials	111,000	1,707,000
Value of products	$54,000	3,940,000
Value added by manufacture	243,000	2,233,000

LION COMPANY LOCATES.

The Lion Motor Car Company of Adrian, Mich., whose plant was destroyed by fire, June 20, is again in the field. A reorganization has been effected and the new plant obtained. It is claimed that the first car will be marketed within a very short time. Within 90 days, it is announced, the company will be turning out its full quota of cars. The firm is to remain in Adrian, despite many reports to the contrary. The Industrial Association of the city has guaranteed $100,000 to keep the factory, and the new plant is considerably larger than the one destroyed. The factory organization remains practically the same.

UNITED STATES TIRES.

All five brands of the United States Tire Company's tires, United States, Hartford, G & J, Morgan & Wright and Continental, are to be merged into one brand, the United States, this fall, according to an indication by Elisha S. Williams, president of the Rubber Goods Manufacturing Company, which is a subsidiary of the United States Rubber Company, and which owns the United States Tire Company and the plants grouped in it.

It was predicted when the new brand was created a few months ago that a consolidation would eventually result, and that the new one would supersede all others. Although it is said that after fall there will be but one brand, there will be several grades to meet market conditions.

According to information from Mr. Williams no decision has been reached regarding a location for the new tire factory that the United States Tire Company is to erect at a cost of from $3,000,000 to $5,000,000. He intimates, however, that it will probably be built in the West.

MERCER AGENCIES COMBINE.

The Whiting Motor Company of New York City recently acquired the Philadelphia branch of the Mercer Automobile Company, 620-622 North Broad street, which will hereafter be conducted as an agency of the Whiting company. The Philadelphia agency will have the territory including Pennsylvania, Delaware and Maryland in addition to the present territory of the Whiting Company of New York and New Jersey, excepting Mercer county, the home of the Mercer factory. The Whiting Motor Company's New York headquarters are at 1802 Broadway with a Newark branch at 486 Central avenue.

BOILLOT USED MOBILOIL.

It appears that while American drivers were not successful in the recent Grand Prix race over the Dieppe course in France, American supplies were victorious. At least, the Vacuum Oil Company, Rochester, N. Y., is in receipt of the following cablegram from its Paris representative: "Boillot driving Peugeot car won Grand Prix, Dieppe, using Mobiloil." Naturally, the result of this test abroad is particularly gratifying to the Vacuum Oil Company, and should prove of interest to all American motorists.

K-D MOTOR COMPANY FORMED.

The K-D Motor Company (Knight-Davidson Motor Company) was recently incorporated for $100,000, for the purpose of manufacturing the K-D motor, the invention of Miss Margaret E. Knight of South Framingham, Mass. The incorporators are Margaret E. Knight, Anna F. Davidson and Beatrice M. Davidson. It is intended to have the principal office of the concern in New York City. Nothing has been done except to file the certificate of incorporation and hold a stockholders' meeting. It is proposed, however, in the near future to open an office in New York City and to vigorously prosecute the business.

PROMOTION FOR NASH.

Following the resignation of W. J. Mead as vice president of the General Motors Company, Detroit, to become president of the Amplex Motor Car Company, Mishawaka, Ind., comes the announcement that C. W. Nash, for the past two years vice president and general manager of the Buick Motor Company, Flint, Mich., a subsidiary of the General Motors Company, has been elected vice president to succeed Mr. Mead. This promotion does not mean that Mr. Nash will relinquish the management of the big Buick plant at Flint. On the contrary, he will continue to concentrate his attention and efforts upon the operation and further expansion of the Buick business, which, under his management, has maintained a foremost rank in the automobile industry.

PERFEX MAKES APPEARANCE.

The Perfex car, designed and built under the direction of James Fouch, and made by the Perfex Motor Car Company of Los Angeles, Cal., recently made its appearance on the Pacific Coast. Considerable ceremony attended the introduction of the first car to the public, H. B. Gurley, assistant secretary of the Los Angeles chamber of commerce, breaking a bottle of Owens river water over the radiator as it left the factory. Several prominent easterners are said to be interested in the new concern.

YOUNG WITH REGAL COMPANY.

C. S. Young, for some time engineer and designer with the Lozier Motor Company, Detroit, has severed his connection with that firm to become assistant general manager with the Regal Motor Car Company, also of Detroit. Mr. Young's experience in the industry dates back to the early days, and he is one of the most widely known engineers in the Middle West today. Previous to his connection with the Lozier people, he had responsible positions with the Electrical Vehicle Company, Pope Manufacturing Company and the American Locomotive Company.

HAYES MADE ADVERTISING MANAGER.

Frank M. Hayes, who has been in the employ of the Luke Horsfall Company, Hartford, Conn., for the past three years, resigned recently to accept a position as salesman and advertising manager of the Lovell-McConnell Company, Newark, N. J., maker of Klaxon and Klaxonet automobile horns.

ADD TO AMERICAN PLANT.

With the completion of the three-story brick and steel addition to its plant No. 2, the American Motors Company, Indianapolis, Ind., maker of American cars, now has what is believed to be the largest manufacturing plant in Indianapolis. This increase in factory space is said to be due to the unusual demand for the underslung types, which are produced by this concern.

At the beginning of the 1912 season it was found necessary practically to double the available space, and again just before the 1913 announcement, plans were made and the foundation laid for a further increase in this respect. This second addition is now completed and ready for occupancy. It is 85 by 120 feet, providing about 30,000 square feet of floor space. The equipment is new and of the latest design. One piece of machinery is a 36-ton hydraulic press to be used in connection with the sheet metal work and in shaping the bodies.

GOODYEAR BOOKLETS ISSUED.

The Goodyear Tire & Rubber Company, Akron, O., recently issued two booklets, entitled "Get All the Mileage from Your Tires," and "Make Inner Tubes Last Longer." Both are small, but contain a fund of information appertaining to its own particular line. The company also recently issued the second number of "Aviation." This contains several photographs of leading aviators and aviation meets, and is extremely interesting.

DURGIN WHEEL PLANT MOVES.

As a result of efforts on the part of the Commercial Club in Hutchinson, Kan., the Durgin Auto Wheel Company has decided to move its plant from Lawrence, Kan. The move was made as the plant required greater facilities. The Durgin wheel is made so as to abolish tire blow-outs, prevent skidding and yet be durable. It has a tire made of selected blocks, which give it exceptional wearing qualities.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from July Issue.)

Fig. 51 represents an ideal method of magneto placing and is one followed by a large number of manufacturers. In this, the device is being fitted to a four-cylinder engine, and as the armature must be driven at the same speed as the crankshaft, it is necessary to use but one extra gear, that being the same size as the engine shaft pinion and driven by the camshaft speed reduction gear. Incidentally, the sketch illustrates the best method of timing the magneto, which is one of the direct high-tension type. The position of the various parts is clearly shown.

Having fixed the magneto to the engine crankcase, the driving pinion, or one of the members of a flange or Oldham coupling, is put loosely on the tapered end of the armature shaft, and the cover to the distributor and the dust cover of the contact breaker are removed to allow one to control the position of the armature. The motor is now turned over by hand so the piston in the first cylinder is at top centre, which can be determined either by watching the crankshaft through a suitable opening in the engine base or by inserting a wire through a compression relief pet cock or spark plug hole, if either of these are at the top of the cylinder.

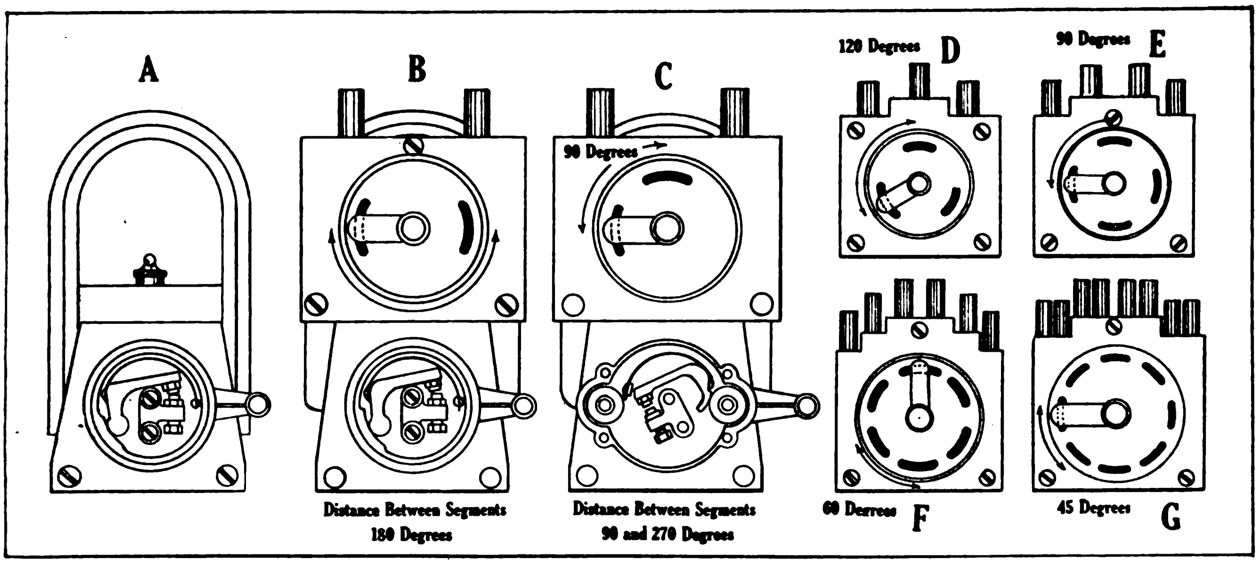

Fig. 50—Important Components of Simms High-Tension Magneto.

The armature of the magneto is then brought to the position indicated in sketch, which represents the fitting of a magneto that is turning clockwise when viewed from the driving end. The distance between the end of the armature and the pole piece should be 15 mm or about .4375-inch. This represents an advance of about .5-inch on a motor with a five-inch stroke. The armature is uncovered by removing the flat casing lying between the horseshoe magnets, this often carrying the safety spark gap (Fig. 49, July issue) and normally serving as a lid. If earlier timing be desired for any special purpose the gap may be widened a trifle, if it be thought the timing is too far advanced, the gap may be lessened. The contact breaker is fully advanced at this time and the contact points are just about to separate. Having placed everything in position as described, tighten the coupling on the taper shaft and ream out for a small taper pin.

The connections to the various cylinders are then made in the order they fire, which can be ascertained by watching the inlet or exhaust valve movements. When the cover to the distributor is off, see at which segment the brush is contacting. The wire to the spark plug in the first cylinder is then led to the terminal corresponding to this segment. Then the plug in the cylinder that is next to fire is coupled to the next segment and so on. The numbers on the distributor show the order in which the various contacts are brought in contact with the rotating distributing brush and not that in which the cylinders fire. In the sketch the cylinders fire 1-2-4-3. Therefore, the segment number 3 is coupled to the plug in cylinder 4, and the segment 4 is connected to the plug in cylinder 3, which is thus the last to fire if the explosion takes place first in cylinder 1. The direction of the distributor brush rotation, if driven by the usual form of gearing is opposite to that of the magneto armature. Obviously, if one cylinder is timed correctly, the remaining members will also fire at the proper time in the cycle of operations. The positions of the armature, distributing brush, contact breaker cam and piston are easily ascertained by inspection of drawing.

Wiring and Plugs.

A magneto should be thoroughly enclosed, if practicable, to protect it from moisture, and the contact breaker and distributor covers should be tight to prevent the entrance of dust. Moisture, metallic or carbon particles and old oil in a distributor will cause internal short circuiting, so the device should be as well protected as possible and the parts frequently cleaned to prevent accumulation of such foreign matter, which acts as a conductor of electricity.

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

The wiring should be of the best quality, and at least .1875-inch of good insulation should be provided. Multiple strand wire is superior to the single conductor, because the many vibratory stresses which exist in a motor car would tend to crystallize a less flexible conductor, though this should have the conductivity of a No. 14 B. & S. gauge copper wire at least.

The spark plugs commonly used for battery and coil ignition are not satisfactory for a magneto, as the current generated by this device is of greater amperage and has a greater heat value than that obtained from coils excited by battery energy. This greater heat has a tendency to burn the slender points thought necessary, and plugs with heavy points are needed to withstand the heating effect. The gap on a magneto plug should be less than that on a coil plug because the current, while of greater amperage and heating value, is of less potential than coil transformed current and manufacturers of such appliances do not advise gaps more than .015625 inch in width. The widening of a gap from burning of the points will introduce too great resistance and the current will not leap the increased gap, so for this reason the most efficient magneto plugs have a plurality of points, so that when the distance between one set becomes too great, the spark will take place between another.

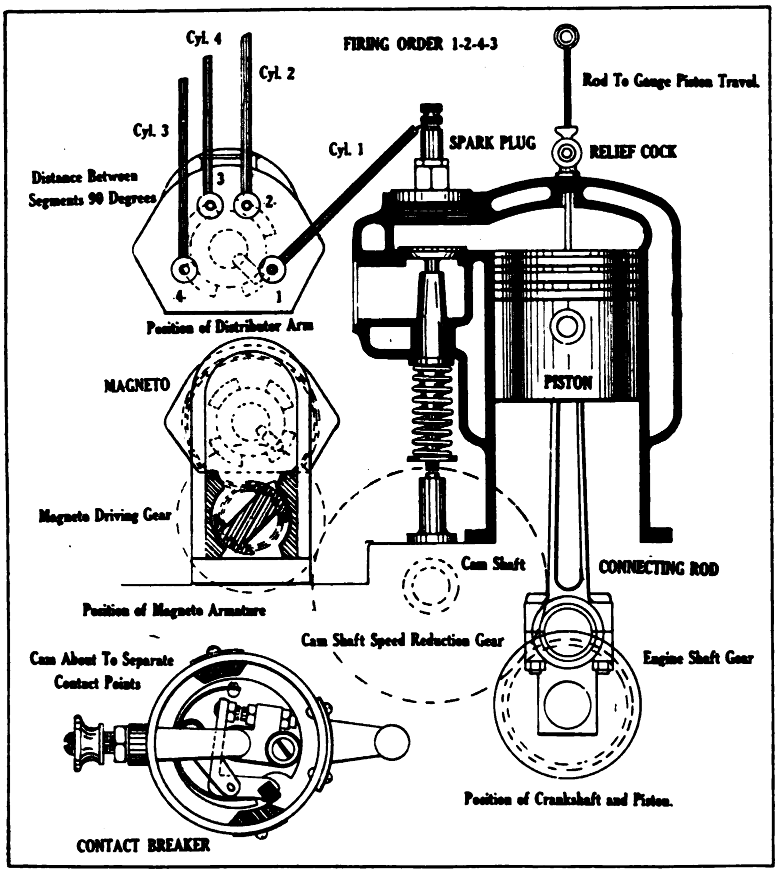

Cyl. 4
Cyl. 2
Cyl. 3
FIRING ORDER 1-2-4-3
Rod To Gauge Piston Travel.
Cyl. 1
SPARK PLUG
RELIEF COCK
Distance Between Segments 90 Degrees
3
2
4
1
Position of Distributor Arm
MAGNETO
PISTON
Magneto Driving Gear
Cam Shaft
CONNECTING ROD
Position of Magneto Armature
Cam Shaft Speed Reduction Gear
Cam About To Separate Contact Points
Engine Shaft Gear
Position of Crankshaft and Piston.
CONTACT BREAKER

Fig. 51—Demonstrating Method of Timing High-Tension Magneto.

Maintenance of Magneto.

The most important points in the care of a magneto are lubrication and keeping the distributor and contact breaker clean. When ball bearings are used, these should receive a few drops of light oil once a week, and when plain bearings are employed, the oil cups, which feed lubricant to the bearings through the medium of a wick feed, should be kept properly supplied. If lubrication is neglected, the bearings will wear and the armature will strike the pole pieces, a condition which is not conducive to efficiency. Cleanliness is important and most cases of irregular ignition can be attributed to dirty oil or metallic particles in distributor or contact breaker. This matter can be easily removed with gasoline and a clean cloth.

In order to amplify the drawings which have been previously presented, illustrations of some of the leading types of magnetos are shown in various stages of completion to outline the construction of the principal parts. The important components of the Connecticut magneto are shown at Fig. 52. As previously stated this device is a low-tension generator having a single winding on the armature utilizing a high-tension transformer or coil housed under the arch of the magnets. The distributor and contact breaker are removed, as is the coil, and practically all of the points that will need attention are shown. A good feature of this device is the slot in the side of the contact breaker housing through which a small file can be inserted to clean the contact points, as shown at Fig. 53.

The Volta magneto is a true high-tension instrument in which the armature has a double winding, and as the various parts shown at Fig. 54 are clearly marked, the general features of construction can be grasped readily. The relation of the parts to each other can be determined by referring to sectional drawings previously shown. The Splitdorf magneto is shown in a dismantled condition at Fig. 55, this view being especially valuable because the contact breaker housing is removed, the distributor cover is dismounted and the armature is taken from the space between the field magnets it usually occupies. In this connection it is well to impress upon the reader that whenever the field magnets are left as shown, the gap should be bridged with a heavy piece of iron which acts as a keeper to prevent loss of magnetism. Obviously this was omitted to make for clearer illustration.

The Splitdorf magneto with the only parts that would ordinarily need attention removed is shown at Fig. 56. Special attention is directed to the small brushes in the distributor and also the two in the contact breaker housing cover, which are practically the only ones used on the instrument. The contact breaker arrangement is also clearly shown in this view. To adjust the points, the check-nut on the insulated platinum tipped screw is backed off and the screw turned with a small spanner wrench to bring the points nearer together or screwed out to make the gap wider.

The principal parts of a Bosch magneto that may need inspection are shown at Fig. 57. The peculiar arrangement of the contact breaker should be noted, this differing from the more conventional types in that small fibre rollers are placed at the sides of the contact breaker housing which merely oscillates, while the entire contact breaker mechanism mounted at the end of the armature revolves. On one occasion, the writer traced a case of ignition trouble to one of these fibre rollers sticking on its bearing, causing it to wear flat on the surface with which the contact lever toe came in contact. After a time the worn contact roller did not break the circuit and the engine missed badly on two cylinders, but ran well on the other two because the revolving roller was breaking the circuit as it should. A new roller was secured and put in place and the trouble ceased. In all cases, these rollers should be a free fit on their bearing pins, but there should be no lost motion at that point.

The moving arm on the contact breakers of the

Bosch, Simms, and some other high-tension magnetos is pivoted in a fibre bush by a short steel stud. To avoid lateral rocking, this stud has to be a fairly tight fit in its fibre socket, and if either the stud becomes rusted, or the fibre swollen by damp, the contact breaker arm may stick.

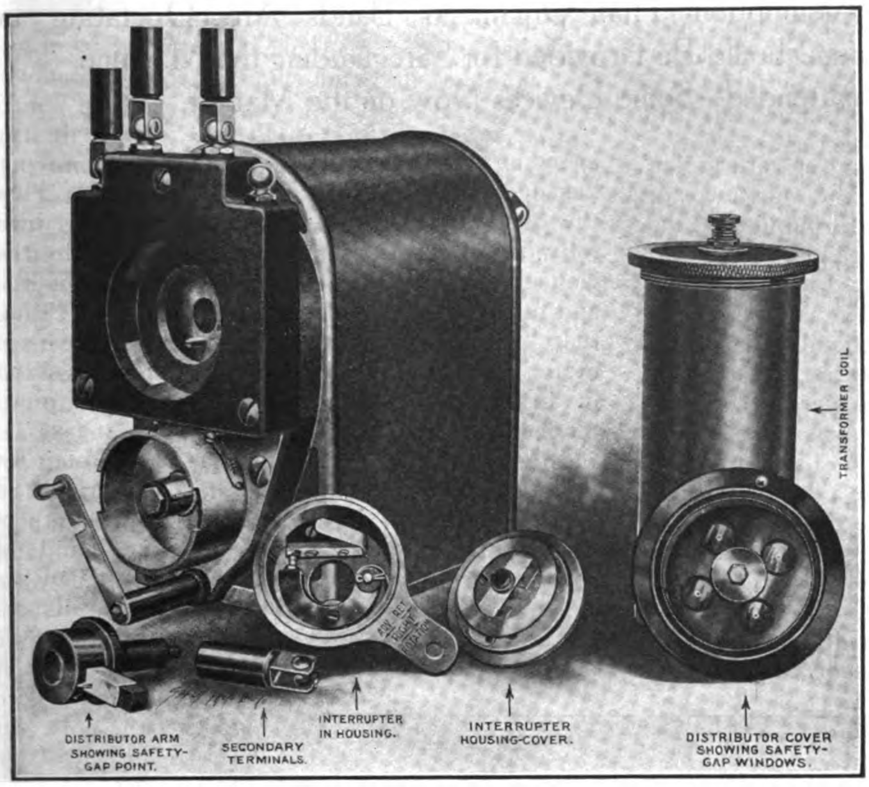

TRANSFORMER COIL
DISTRIBUTOR ARM SHOWING SAFETY-GAP POINT.
SECONDARY TERMINALS.
INTERRUPTER IN HOUSING.
INTERRUPTER HOUSING-COVER.
DISTRIBUTOR COVER SHOWING SAFETY-GAP WINDOWS.

Fig. 52—Principal Parts of the Connecticut Magneto.

The trouble is particularly frequent in bad weather, or when a machine has been laid by in a damp atmosphere for some weeks or months, and is rather elusive. Its nature is invisible until the dustcap has been removed, and very frequently the arm is freed by a touch of the fingers when the contact breaker is being examined. Then the cover is replaced, and ere long the mishap is repeated. It is easily remedied by polishing the steel stud with emery cloth, or by very gingerly enlarging the hole in the fibre with the aid of a rat-tail file.

Obviously, every type of instrument has peculiarities in construction that may result in troubles that would only occur with that specific type, but there are a number of minor derangements that all magnetos are heir to and the few general suggestions which follow are intended to apply to practically all forms. For instance, direct high-tension instruments have no separate coils, and any electrical trouble must exist in the instrument itself, whereas in the types that employ a step-up transformer irregular operation may be due to the coil or the magneto, if not at the plugs or in the wiring.

In Event of Trouble.

Should there be any irregularity of action of the motor it is well to examine other conditions before tampering with the magneto, especially if it has operated satisfactorily after installation. If other adjustments are right, the ignition system can be suspected. When a double ignition system is used the engine operating correctly with the independent battery and coil system must indicate that the magneto group or its components are at fault.

If the missing is confined to one cylinder, there is either something wrong with the spark plug or the wire leading thereto from the magneto. See that there is no break in the insulation or the wire, and that there is a positive connection at either end. Note the condition of the plugs, see that they are clean, that the insulation is not cracked or punctured and make sure that the spark plug points are separated by a suitable air gap. If, however, the missing is first in one cylinder and then in the other, it may be possible, if the wiring and plugs are all right, that the platinum contact breaker points need adjusting or cleaning. Make sure that the inside of the secondary distributor is clean, free from all old oil, water or metallic particles which short circuit the current.

The most fertile source of trouble in a magneto of any type using carbon brushes is poor contact or breakage of these small but important members. In a high-tension instrument the collecting brush at the driving end should be inspected in event of failure to generate current. This is housed in an easily removed bushing screwing in the magneto base and if the brush is broken it may be easily removed and a new one substituted. On low-tension magnetos using transformer coils, the primary collecting brushes sometime fail, or wires become loose at the coil and contact breaker terminals. It is well to have a few spare brushes on hand at all times, as they are not costly and easily renewed, and the magneto is out of commission should either one of the main collecting or distributing members break. Some instruments use small wire gauze members that are not likely to break, but the carbon members are fragile and sometimes fail in service at an inconvenient time.

Function of Switch.

An important point of difference between magneto and battery ignition which often causes some confusion in the minds of the motorist is in the interruption of the magneto energy by a switch. In this it is well to remember that when it is desired to discontinue battery and coil ignition, a switch is provided which opens the circuit, with a magneto the conditions are the opposite. A switch is closed and a short circuit established between the primary and the ground when energy is no longer needed, as when shutting off the motor, this grounding the current.

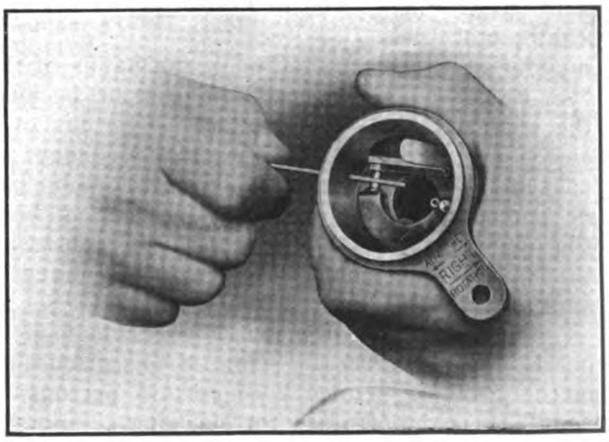


Fig. 53—Method of Cleaning Contact Points of Connecticut Magneto.

(To Be Continued.)

PROTECTING THE CAR AGAINST THEFT.

Conditions Warrant the Assumption That Organized Bands Are Operating in Many Sections---Means Should Be Provided for Safeguarding the Machine When Left Unattended---Some Devices Now on the Market.

TWO hundred and eleven motor cars stolen within seven months is the substance of the report recently made public by the police department in Detroit. This means an average of one automobile theft a day in that city, and the situation may be regarded as an example of what is taking place in practically every city of consequence in the United States. Of the 211 machines stolen in Detroit 209 were recovered, but in each instance the owner was called upon to face losses, which were it possible to secure authentic figures, must aggregate a decidedly substantial sum. Even if insurance companies were called upon to make good this sum, the owners were still losers, through inability to use their machines for a given period.

Automobile theft may be divided into at least two classes. First, there is the organized gang which either drives the machine to some secluded spot and strips it of such parts and accessories as can readily be turned into money, or completely renovates and sells the car. Then there is the party which starts upon what has come to be termed a "joy ride."

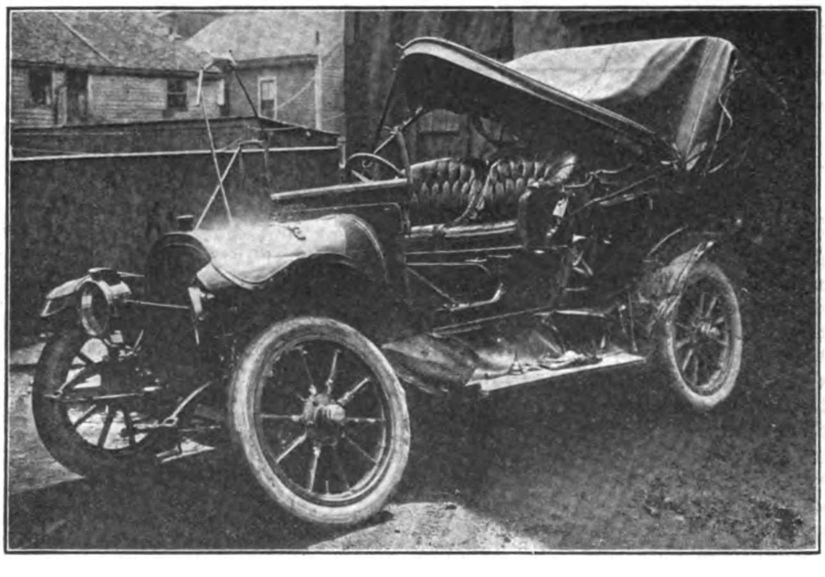


Fig. 1—A Striking Example of What May Be Expected as the Result of the So-Called "Joy Ride."

Fig. 1 presents a striking example of the manner in which cars suffer at the hands of the "joy rider." This situation may arise because the chauffeur utilizes the machine for his own enjoyment without the owner's knowledge or consent, and the possibility of such results has occasioned no little worry on the part of both the owner and the garage proprietor. However, that is a subject which can best be considered in another manner.

While this condition exists, that which more nearly comes within the scope of this discussion is the growing tendency of certain persons to watch their opportunity for securing temporary possession of a car when it is left unattended outside the garage, in front of the owner's home or place of business, or elsewhere. Within the past few months, comparatively speaking, almost every city, and even many of the smaller towns, has developed thievery of this character. That the owner needs to be protected from his own folly in this respect semes to be borne out by the clause in the motoring law of Massachusetts, and in the laws of several other states, providing that "no person having control or charge of a motor vehicle shall allow such vehicle to stand in any public street or way and remain unattended without first locking or making it fast."

Fig. 2 depicts a car which has been stolen for the purpose of stripping it of the accessories. So prevalent has this form of theft become, both in this country and abroad, that organized bands of automobile thieves have come into being, with a splendid system of obtaining plunder and disposing of it by means of "fences." Judging from the fact that 209 of the 211 cars stolen in Detroit were recovered by the police, it seems probable that a large proportion of the thefts were committed by some such band.

Within two years, the practise of stealing cars outright, the vehicles being completely overhauled and sold to unsuspecting purchasers as second hand machines, seems to have been gaining rapidly. This situation becomes the hardest of all with which the police have to deal, and the owner naturally is subjected to the greatest loss. Whenever the cars have been recovered, which has been seldom indeed, it has been found that they have been stolen in New York City, for instance, and disposed of in some middle western city. This would indicate that those engaged in this form of theft operate upon a large scale, and many times the condition of the recovered machine has been such as to suggest that they had access to a well equipped plant for the renovation of automobiles, including painting, replacement of parts and other extensive alterations.

A fruitful field for the activity of either band of thieves mentioned above may be found at Fig. 3, which represents an open air stand for automobiles utilized by the business men of a large city in the East. Here the machines have been permitted to remain throughout the day, and often long into the night, absolutely unprotected, except in such manner as can be afforded by the occasional visit of the patrolman in making his rounds of duty. It may be argued that as this open air garage is within full view of office buildings, and the public is passing to and fro at all times, there is little possibility that anyone other than the rightful owner or chauffeur would attempt to drive away a car, but this condition has not obtained in practise. Thieves so well organized as has been indicated herein do not hesitate to take chances of being discovered, and it will be admitted that the public generally is too busy with its own affairs to make a mental note as to whether or not the man seen entering an automobile in an open square is entitled to do so.

It is well enough to provide insurance against theft, which aims to reimburse the owner for all losses of this character above $25, whether the loss is occasioned by the so-called joy ride, in which the machine may be as thoroughly damaged as indicated in Fig. 1, or it is the result of dismantling as presented in Fig. 2. It will be admitted, however, that this protection by no means satisfies the owner, when his machine is missing, and he is in need of a car to carry on his business or to prevent rearrangement of his plans in other ways.

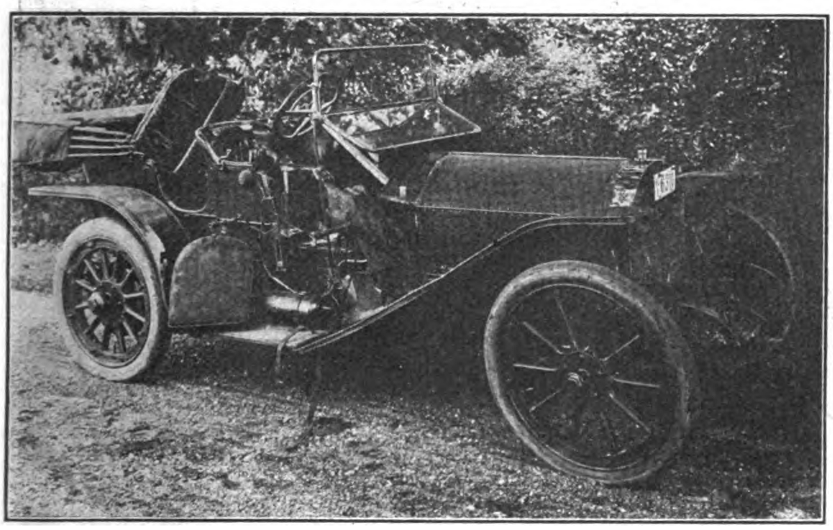


Fig. 2—Car Abandoned by Automobile Thieves After Being Stripped of Articles That Can Be Turned Into Ready Money.

These conditions have resulted in the production of numerous devices, designed for the absolute protection of the car at all times, when left unattended. The object of this discussion is to present the merits of these various offerings, as outlined by the manufacturers, and it is assumed that the motoring public will be interested in comparing their particular features.

Those familiar with the components of the motor car realize that gasoline must be fed to the carburetor where it is vaporized and that the mixture in the cylinder must be exploded by a spark. If the main supply be cut off it is obvious that the machine can be operated but a short distance, a few blocks or so, as the fuel soon falls below the vaporizing level in the float chamber or becomes utilized. Similarly, if the ignition circuit be broken on one side by means of a locked switch, it will be impossible to start the motor until the connection is re-established.

Two other factors are essential for the operation of the automobile, namely the clutch and transmission. With the former held out of engagement and locked, even with the motor in operation, it would be impossible to move the machine under its own power. With the sliding gearset, the retention of the gear shift lever in neutral would prevent theft of the vehicle, as a set of gears would have to be brought into engagement before the energy of the motor could be utilized. The design of the planetary transmission does not lend itself readily to locking, but with this type use may be prevented by locking the steering wheel, fuel or ignition systems. The various applications of the above methods are described and illustrated herein.

The Gasolock, shown in Fig. 4, is marketed by the International Sales Company, 412 Scherer building, Detroit. It comprises a Yale cylinder lock enclosed in a brass head or ball connected by a tube to a valve inserted in the line between the gasoline tank and carburetor. The cylinder lock is gear meshed with the stem of the valve in such manner that the operation of the key locks and unlocks the fuel supply.

The device is securely bolted to the dash and in locking the gasoline every portion of the Gasolock is locked. It is maintained that it cannot be shakened off or removed in any way without first working the lock. Inasmuch as this portion of the device is made by the Yale & Towne Manufacturing Company, each key is distinctive. The valve, stem and head are produced by the Detroit Lubricator Company.

The Troy Carriage Sunshade Company, Troy, O., manufactures the Troy automatic auto-lock shown at Fig. 5. This is one of the combination, keyless devices, in which the combination may be changed at the will of the owner. This latter operation is performed by simply removing the face of the lock, utilizing a special key provided for that purpose, and manipulating the little levers seen in the illustration, as is desired. However, it is impossible to employ this special key before the original combination has been worked and the bolt drawn up to a given point, so that a person ignorant of the combination would be helpless even if he secured temporary possession of the special key.

The cut presents the location of the lock on the speed lever, and in applying it it is necessary to make a slot through the lever so that the locking dog or flattened bolt can slide up and down in the slot. This dog projects on each side beyond the faces of the speed lever to such an extent that when the lever is in neutral and the bolt is forced downward it slides snugly between the inner sides of the quadrant, preventing the movement of the lever from its neutral position. It is maintained that if attempt be made to wrench the lock from the lever, the lock itself takes none of the strain and the lever would be broken off before the lock would yield.

The Campbell locking control lever at Fig. 6 A is particularly unique, in that it is impossible to suggest how the device is operated, unless previous knowledge has been obtained. There is held to be no manner in which the lock may be picked as a four pin tumbler Yale lock is employed, and of course, the entire apparatus is worked from the seat. It is the product of the Auto Specialty Company, Toledo, O.

It will be noted that the locking mechanism apparently is located in the top of the lever, which is substituted for that furnished with the car. In reality, however, the locking shaft extends down through a hollow steel lever to engage in the neutral point of the sector. The key is inserted in the top of the handle, as indicated, and when removed the thief is puzzled to understand why he cannot manipulate the lever in any manner.

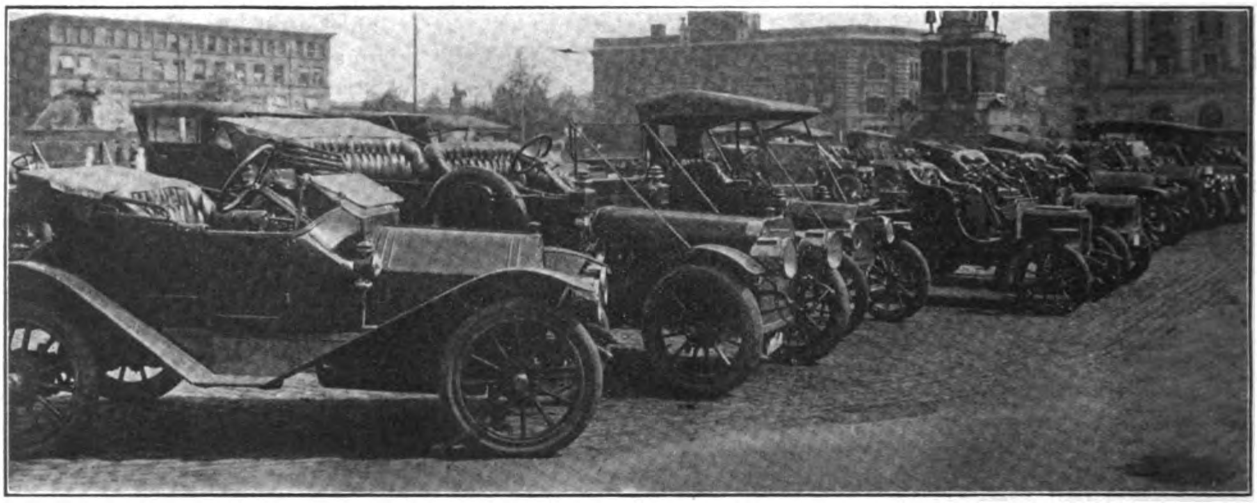


Fig. 3—Cars Parked in Public Square Without Attendant—A Fruitful Source of Trouble from Automobile Thieves of Every Class.

The Globe Auto Lock is presented at Fig. 6 B. This is manufactured by the Globe Auto Lock Company, Canisteo, N. Y., and is a simple, compact valve attachment with provision for inserting in the fuel line. It may be fitted to the outside of the car body, under the seat or any other convenient place. When the lever is moved it shuts off the supply of fuel positively and locks the device. The entire arrangement is outlined in the drawing.

Another device which locks the gear shifting lever is the Crown, made by the Wiener-Barnet Company, 312 Adams street, Newark, N. J., and illustrated at Fig. 6 C. This differs materially from those previously described in that there is no drilling, filing or changing of any of the mechanism by means of which the car is operated.

In the drawing the padlock can be seen underneath the quadrant. About the lever which has been locked in neutral may be noted a notched bar, which is slipped into place, when it is desired to lock the car. The padlock is fastened into a hole at the lower end of this bar and renders it impossible to release it, and consequently the lever, until this lock has been unlocked in the customary manner.

The Fetterlock at Fig. 6 D is somewhat similar, in that a small bent plate slips over the quadrant, this having an opening for receiving a lip with a hole in it. Through this hole the padlock, fitted with either Corbin or Yale tumbler lock, is slipped. In practise the lever is thrown into neutral and the plate, lip and lock applied. It is claimed that it will fit any make of car having selective or progressive transmission. It is made by the Autolock Company, 2828 Smallman street, Pittsburg, Penn.

The principle involved in the Rochester safety lock at Fig. 6 E is entirely different. The lock itself is a three tumbler combination, keyless device, capable of a large number of different combinations, and in this respect it affords the same possibilities as the Troy device described above. It is made by the Rochester Safety Lock Company, 530 Main street, Rochester, Ind.

This apparatus is applied to the steering post. It will be noted that there is a .25-inch lug or pin projecting inwardly from the hasp of the lock. This is supposed to enter a .25-inch hole drilled in the steering column, about eight or 10 inches below the steering wheel, and in the front side of the bar as the driver sits in the seat. This will put the lock at the right hand of the driver and make it possible to operate it from the seat. The idea of application is that, in most cases, one part of the steering column is stationary, while the other rotates with the steering wheel. The lug in place holds the bar rigid and makes the car useless.

The Blackburn lock switch at Fig. 6 F offers a means for locking the ignition circuit. The

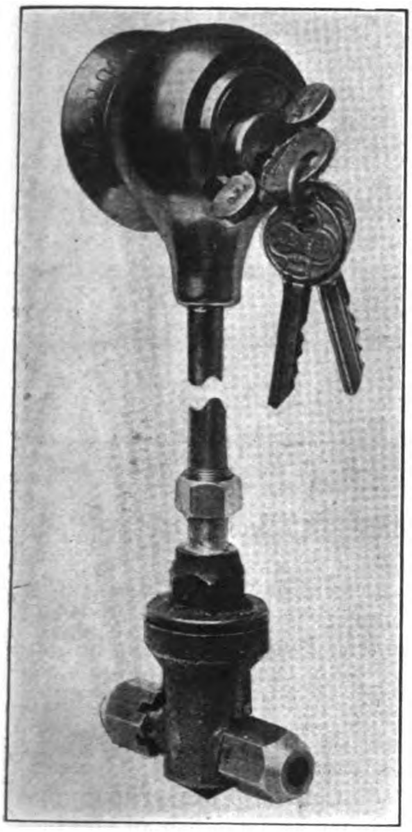


Fig. 4—Gasolock for Securing Fuel Supply.

plan is that of substituting for the usual ignition key and socket, supplied by the maker of the unit, a Yale lock of the pin and tumbler type, the key to this acting as the ignition plug. Obviously, when this key is removed the switch cannot be turned except with a duplicate. It is maintained that the switch cover cannot be removed even if unscrewed, until after the key has been inserted and turned to releasing point, and that when the switch is mounted on the coil it is impossible to short circuit the wiring. The maker is the Blackburn Specialty Company, 1120 Prospect avenue, S. E., Cleveland, O.

Still another means of locking the gear shifting lever is presented in the Saunders automatic lever lock at Fig. 6 G. This is the product of F. H. Kelsey & Co., 408 Frankfort avenue, N. W., Cleveland, O. It will be noted an attachment fitted with a spring is permanently fixed to the side of the lever, its bottom portion engaging with the quadrant when the lever is in neutral and the top of the spring device is pushed downward. Pushing this down, either with the hand or foot, automatically operates the Corbin tumbler lock, which cannot be unlocked except with the individual key. Unlocking the lock automatically throws the bottom portion of the device out of engagement with the quadrant and permits the use of the lever in any position desired.

The Johnstone ignition lock at Fig. 7 A differs from the Blackburn in that it is worked by a combination lock instead of a key. It is made by the Johnstone Auto Lock Company, Cleveland, O., and is composed of a pressed steel box, fastened over the coil box and attached to the dash by screws inside. When in position, it is maintained that the engine cannot be started unless the combination is known, and that the latter can be changed at the will of the car owner.

The Parker lock at Fig. 7 B is another supplemental device for insertion at the quadrant in order to secure the gear shifting lever. It is the product of the General Utility Company, 1326-1330 Ogden street, Philadelphia, Penn. The attachment is hinged, so as to slip around the lever when in neutral, and locks by means of a Yale lock. The maker calls attention to the fact that no filing or drilling is required.

The Watch Dog, made by S. Breakstone, 1712 Michigan avenue, Chicago, and shown at Fig. 7 C, consists of a pair of hinged arms which slip around the steering wheel spider, and the throttle and spark levers. It may be had either with or without padlock, that furnished with the device being of the Corbin make. It is claimed by the maker that it is possible to leave the car with the engine running, as when the lock is applied under such conditions the machine can be operated in a circle only.

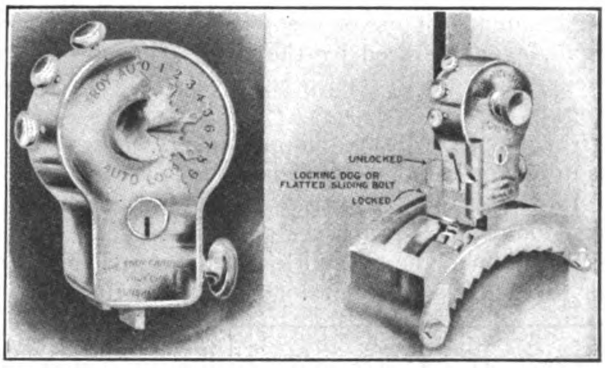


Fig. 5—Troy Automatic Auto-Lock: At Left, the Lock Itself; at Right, Applied to Gear Shifting Lever.

A device for locking the clutch pedal is depicted at Fig. 7 D, this being the Auto safety lock made by Daniels & Woods, Los Angeles, Cal., and marketed by Smalley Daniels, 23 Motor Mart,

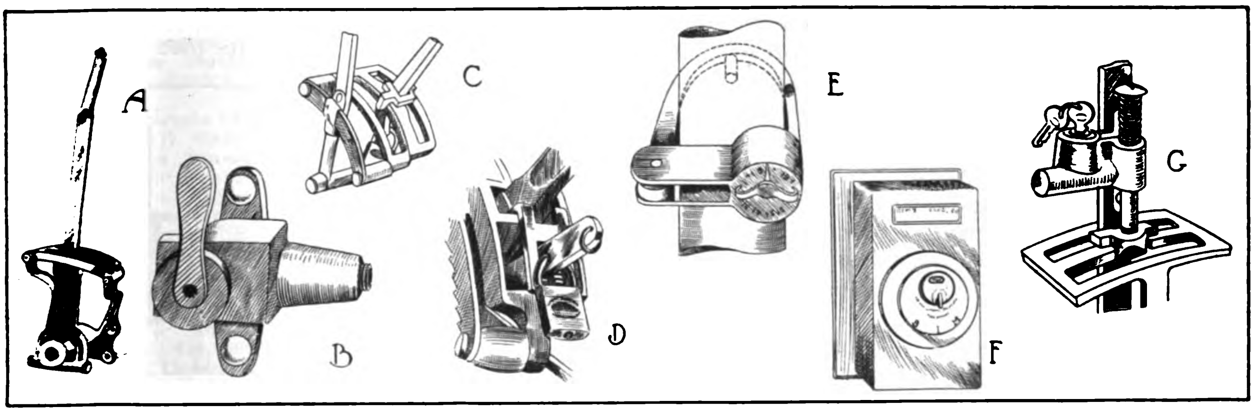


Fig. 6—Some Interesting Types of Automobile Locking Devices: A, Campbell Lever; B, Globe Fuel Lock; C, Crown; D, Fetterlock; E, Rochester Safety Lock; F, Blackburn Lock Switch; G, Saunders Automatic Lever Lock.

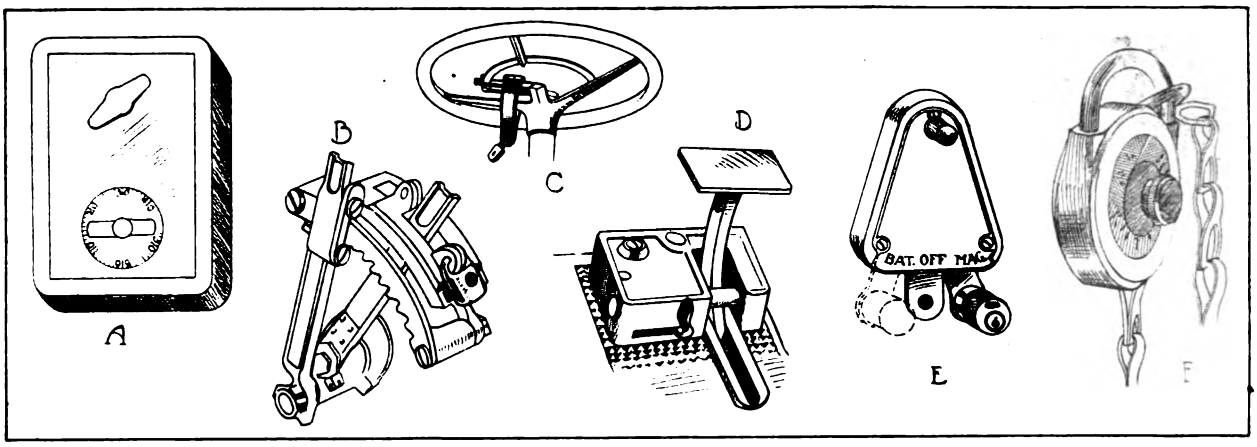


Fig. 7—Other Devices for Securing Cars Against Theft: A, Johnstone Ignition Lock; B, Parker; C, Watch Dog; D, Auto Safety Lock for Clutch Pedal; E, Yale Ignition Lock; F, Miller's Keyless Padlock.

Boston. The apparatus is neat in appearance and is always ready for service. The locking arrangement comprises a short bar, which slips across back of the clutch pedal, and holds it out of engagement. This is thrown into action by a small lever operated by the foot, while a key is needed in order to release it when it is desired to operate the car.

As has been stated most makers of ignition equipment supply some form of lock with the coil switch, and the Yale & Towne Manufacturing Company, 9 Murray street, New York City, has developed the special lock shown at Fig. 7 E for this purpose. When locked in the neutral position the switch lever cannot be moved until released by the individual key.

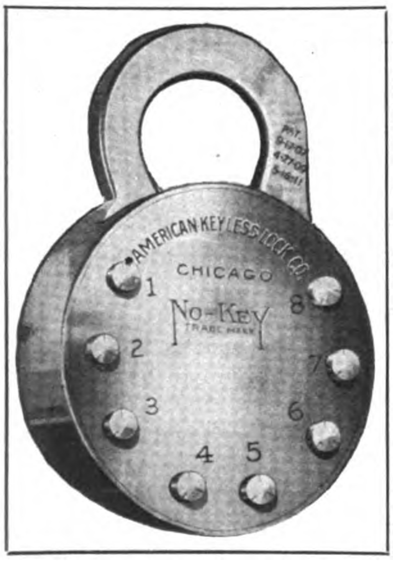


Fig. 8—No-Key, a Combination Padlock.

The J. B. Miller Keyless Lock Company, Kent, O., manufactures the padlock presented at Fig. 7 F, this being a combination device. That in the drawing is more commonly used on motorcycles, although the padlock can be utilized either with or without the chain. The concern is engaged upon the production of a special device for locking the steering gears and levers of an automobile, but this is not yet ready for announcement.

Still another combination lock is the No-Key, produced by the American Keyless Lock Company, 619 West Jackson boulevard, Chicago, and depicted at Fig. 8. This is made entirely of brass, and is utilized in the same manner as any padlock, with the exception that it is opened by working the combination. Any of the numbers from 1 to 8 on either side of the lock may be employed in the combination and it is claimed that more than 40,000 different combinations are possible on each lock.

Besides making locking devices for its ignition equipment, the Connecticut Telephone & Electric Company, Meriden, Conn., produces the Autolock presented at Fig. 9. This is a simple form of padlock, so small as to be carried in the vest pocket with ease, and is designed to be applied to the ratchet brake lever as depicted. The construction is from a solid block of brass, machined out to receive the mechanism which is of the ball bearing pin tumbler design. The shackle and steel inserts are hardened so they cannot be filed.

No attempt is made to include all of the devices upon the market, but rather to present the varying features of those which have been brought to the attention of the motoring public. That there is need for some kind of protection against theft is being borne home to the automobile owner almost daily. The market affords ample opportunity for securing this protection, it would appear. There are other features of the situation which might be considered, but space does not permit of their presentation here.

TAKES OVER SALES END.

Aug. 1 the Hood Rubber Company, Watertown, Mass., took over the entire business of the Shawmut Tire Company, which had up to that time acted as its selling agent for automobile tires, tubes and accessories. In the future the Hood Rubber Company will not only manufacture, but will also sell, bill and collect all accounts and carry on the business in its own name.

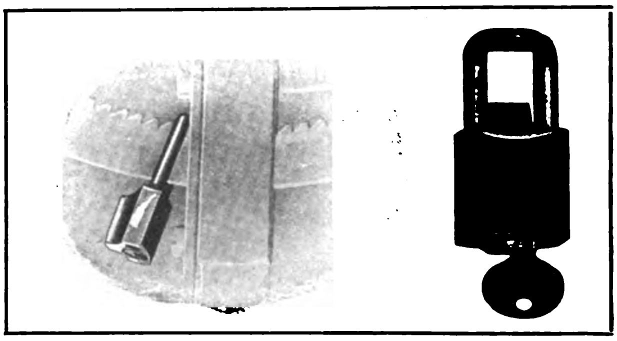


Fig. 9—Connecticut Autolock and Method of Attachment.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following companies have been incorporated recently to manufacture and deal in motor cars, accessories, etc.

Commercial Motor Sales Company, Cincinnati, O.; $10,000; incorporators, Walter G. Voesler, George Schorr, Edward W. Hoelscher, William G. Hoelscher, George Saline.

Kernodle-McDaniel Manufacturing Company, Frankfort, Ind.; $10,000; incorporators, W. T. Kernodle, P. McDaniel.

A. S. Lee Company, Providence, R. I.; $5000; incorporators, Daniel J. Healy, H. Ladd Walford, G. Otis Washburn.

Skaneateles Garage Company, Skaneateles, N. Y.; $6000; incorporators, George D. Cuddleback, Edward J. Scott, Florence K. Scott.

Premier Manufacturing Company, Newtown, Conn.; $10,000; to deal in automobile accessories; incorporators, Alfred C. Griscom, Julius Hartwig, Louise Hartwig.

Everett Auto Sales Company, Columbus, O.; $30,000; incorporators, Horace K. Dobson, Amos F. White, Elmer F. McConaha, H. H. Kellenberger, A. W. Raving.

Audobon Auto Service Company, New York City; $500; to operate an automobile service; incorporators, Michael P. Caffe, Edmond Huertstel, Julius M. Ferguson.

R. F. Flick Automobile Company, Cuero, Tex.; $10,000; incorporators, R. C. Flick, R. F. Flick, N. M. Crain.

Harlem River Garage & Repair Company, New York City; $900; incorporators, Edward Meltzer, Frank D. Tice, William T. Hookey.

Waite's Motor Vans & Storage Company, New York City; $25,000; incorporators, Francis T. Germain, Philip J. Dunn, Louis Burgess.

Chillicothe Automobile Supply Company, Chillicothe, Mo.; incorporators, John F. Heger, Asa T. Kirtley, Byron B. Stevens.

Simpson Automobile Supply Company, Grand Rapids, Mich.; $35,000; incorporators, Earl R. Corbin, E. W. Simpson, Frank J. Goders.

Darby Motor Car Company, Westfield, N. J.; $25,000; to manufacture automobiles and motorcycles; incorporators, L. D. Darby, H. C. Darby, A. B. Darby.

Model Auto & Sales Company, St. Louis, Mo.; $3000; incorporators, Oscar Sontag, Roy E. Stutts, Otto F. Karbe.

Burns-Ramsden Motor Car Company, St. Louis, Mo.; $10,000; incorporators, Louis N. Burns, James H. Ramsden, Harry C. Barker.

Galva Auto Company, Galva, Ia.; $10,000; to deal in motor cars; incorporators, G. W. Johns, R. B. Clemens and others.

Penn Tire Filler Company, Coudersport, Penn.; $5000; to manufacture tire filling compounds.

Central Garage Company, Indianapolis, Ind.; $5000; to operate a garage; incorporators, Walter Howe, Kirke Howe, H. R. Sterling.

Republic Motor Company, New York City; $500; incorporators, Frank H. Twyeffort, Stephen C. Fiero, Ernest J. Ellenwood.

American Steam Truck Company, Saginaw, Mich.; $500,000; to manufacture steam motor trucks.

Check-Spring Motor Company, Washington, D. C.; $100,000; incorporators, C. E. Hooper, A. S. Check, C. L. Lambert.

Auto Distributors Limited, Camden, N. J.; $200,000; incorporators, F. R. Hansell, I. C. Clow, John A. MacPeak.

Perth Amboy Transportation Company, Sewaren, N. J.; $25,000; incorporators, I. J. Freeman, Lena Chester, Isabella Robbins.

Orange Automobile Garage, Inc., East Orange, N. J.; $20,000; incorporators, S. L. Gedney, Jr., J. D. Gedney, H. R. Picking.

Scott Motor Company, Memphis, Tenn.; $10,000; incorporators, J. C. Scott, W. H. Hayley, C. L. Hunt, O. N. Bonney, J. C. Sims.

Southwestern Motor Car Distributing Corporation, Memphis, Tenn.; $50,000; incorporators, J. W. Bondurant, Noble S. Bruce, George C. Love, Thomas B. Crenshaw, H. J. Reiner, P. H. Phelan, Jr.

W. S. Motor Company, New- [illegible] N. J.; $300,000; incorporators, J. M. Woods, C. H. T[illegible] and L. F. Fetser.

King Valveless Automob[illegible] Company, Cleveland, O.; $25,000; incorporato[illegible] Feffield, Orville C. Snyder, Geo. H. Burrows, R. E. McMasters, C. J. Lowrie.

Consolidated Automobile Supply Company, New Brunswick, N. J.; $1,000,000; incorporators, B. F. Hardesty, Arthur V. Dennan, Samuel A. Ross.

Metrix Automobile Company, Joliet, Ill.; incorporators, Earl D. Fuller, W. O. Dayton, J. T. Wilcox.

Overland-Wisconsin Company, Milwaukee, Wis.; $50,000; incorporators, George W. Browne, Mark F. Browne, Thomas C. McMillan.

Sheagren-Hunt Company, Burlington, Ia.; $2500; Chalmers, Reo and Peerless agent; incorporators, W. B. Hunt, J. P. Sheagren, Fred Sheagren.

South Bend Auto Body Company, South Bend, Ind.; $20,000; to manufacture automobile bodies and parts; incorporators, V. E. Paxson, S. W. Nicholson, J. C. Paxson.

Dillman-Helin Motor Company, Richmond Hill, N. Y.; $20,000; directors, William C. Dillman, Richard A. Dillman, Bero W. Holin, W. J. Bissell, Fred G. Hoerlein.

Spencer-Wilkie Motor Car Company, Morristown, N. J.; $30,000; incorporators, E. A. Carpenter, C. P. Spencer, William W. Wilkie.

Medoc Motor Company, Chicago, Ill.; $2500; incorporators, S. Heberling, William A. Curtis and others.

R. L. Bishop Company, New Haven, Conn.; president and treasurer, Raymond L. Bishop; secretary, Frank P. Sargeant.

Consolidated Auto Company, Columbia, S. C.; $5000; to sell motor cars and supplies; incorporators, J. P. Roddey, John J. Cain, J. P. Matthews.

Capitol City Garage Company, Hartford, Conn.; $50,000; incorporators, Conway Hale Brooks, James Leslie Burton.

Vermont Cadillac Company, White River Junction, Vt.; $500; to purchase, repair and sell automobiles; incorporators, G. H. Miller, Richard Hoar, H. G. Bennett, H. R. Miller.

Indianapolis Tire Company, Indianapolis, Ind.; $300,000; to manufacture tires; incorporators, A. A. McKain, E. J. Holliday, A. C. Ayres.

Northwest Auto Company, St. Joseph, Mo.; $5000; incorporators, Ben F. Ellington, Claude C. Tanner, Lena M. Ellington.

Mutual Motor Car Company, Buffalo, N. Y.; $125,000; incorporators, Albert Poppenberg, Fred C. Carter, Orson Yeager.

East Palestine Rubber Company, East Palestine, O.; $50,000; incorporators, E. E. Jones, Ulrich Winter, C. A. Oatsdean, Joseph Hick, O. L. Shumate, A. S. Mauk, Abram Hartley.

Folberth Carburetor Company, Youngstown, O.; $70,000; to make carburetors and automobiles; incorporators, E. A. Hegg, N. A. Emery, E. A. Tobey.

Sutton-Miller Company, Indiana, Penn.; $5000; incorporators, R. S. Sutton, J. Blair Sutton, J. N. Miller, J. W. Clement, Ernest Stewart.

Stocker Rubber Company, Dayton, O.; $50,000; to manufacture automobile tires and accessories; incorporators, A. D. Stocker, Ira J. Cooper, W. H. Brennerm, F. W. Johnston, J. W. Brumbaugh.

D. Henry Bonner Company, Cambridge, Mass.; $20,000; incorporators, David H. Bonner, Edward S. Howland, William E. Furniss.

Studebaker Sales Company, Buffalo, N. Y.; $25,000; incorporators, A. W. Haile, B. H. Phillips, E. C. Schlenker

Auto Transportation Company, Dixonville, Penn.; $85,000; incorporators, W. C. Carr, G. W. Carr, J. H. Prescott, Thomas E. Boyd, F. Bertolette.

Essenby Sales Company, Fresno, Cal.; $10,000; to deal in automobiles, supplies, etc.; incorporators, H. M. Shaffer, P. W. Cypher, T. R. Becker.

Brown Machine Company, Winchester, Conn.; $5000; to repair motor vehicles, engines, etc.; incorporators, Edward E. Brown, Edward E. Brown, Jr., William A. Brown.

Davies-Bach Manufacturing Company, Cleveland, O.; $300,000; to manufacture motor car accessories; incorporators, George R. Nash, C. H. Davies, O. Nelson, O. Lampus, P. D. Metger.

Fox Spring Tire Company, Spokane, Wash.; $1,000,000; to manufacture motor car tires; incorporators Porter C. Fox, D. D. Woolsley, W. E. Allen.

Sullivan Automobile Company, Newark, N. J.; $25,000; to deal in motor cars; incorporators, J. Sullivan, C. Bagnole, W. N. Frankel.

Central Motor Car Company, Canton, O.; $25,000; to deal in motor cars; incorporators, R. F. Wilson, D. L. Tachants, D. B. Wilson, Anna Herr.

Modern Tread Company, Seattle, Wash.; $20,000; to manufacture motor car tires; incorporators, L. V. Fox, A. H. Shoemaker and others.

Geo. W. Browne, Automobiles, Inc., Milwaukee, Wis.;

$5000; agent for Overland, Marmon and Stutz; incorporators, George W. Browne, Mark F. Browne, Thomas C. McMillan.

Automobile Lamp Control Company, Dayton, O.; $15,000; to make automatic lamp controls for automobiles; incorporators, Henry Ehlen, Ernest A. Eastman, William B. Meeker.

Thomas G. Wolverton Company, Jersey City, N. J.; $10,000; general automobile business; incorporators, C. A. Cole, H. T. Letts and others.

Tesla Auto Light Company, Chicago, Ill.; $6000; to manufacture automobile supplies; incorporators, Charles B. Stafford, Harry C. Levinson, Albert Jacobs.

Akron Airless Tire Company, Akron, O.; $50,000; to manufacture tires and rubber goods; incorporators, William S. Brooks, Joseph J. Surbey, Ira N. Thompson, Frank H. Beyea, G. E. Gilmore.

Swing Wheel Company, Cleveland, O.; $50,000; to manufacture automobile wheels; incorporators, A. J. Swing, B. Gross, H. C. Cummings, Harry Pott.

Pugh Auto Chain Company, St. Louis, Mo.; $5000; to make non-skid chains; incorporators, John Schulz, Webster Groves, A. A. Van Cleve.

Wallace Automobile Company, Wilmington, Del.; $300,000; to manufacture, sell and deal in all kinds of motor vehicles; incorporators, Clarence J. Jacobs, S. E. Robertson, Harry W. Davis.

Central Automobile Company, Newport, Ky.; $15,000; incorporators, Walter P. Dickerson, Gus Koehler, Clyde Emrick.

Union Motor Car Company, Tacoma, Wash.; to deal in motor cars; incorporators, R. A. McCormack, George A. Stewart and others.

Michigan Motor Specialties Company, Detroit, Mich.; $20,000; to manufacture motor car devices; incorporators, Nelie M. Beck, Charles W. Beck, Charles Wright, Jr.

Western Massachusetts Essenkay Company, Springfield, Mass.; $6000; to deal in automobiles, etc.; directors, Frank E. Driscoll, John L. Flanagan, Raymond L. Flanagan.

Penn Auto Company, Brooklyn, N. Y.; $5000; incorporators, Louis L. Bendell, Harry C. Patridge, Morris Wolf.

Elliott Motor Engine Company, Boston, Mass.; $300,000; incorporators, Elmer E. Lane, Charles H. Card, Harry C. Brandt.

Mutual Oil & Auto Supply Company, Cleveland, O.; $10,000; incorporators, H. L. Stouer, H. C. Killiman, Herbert House, C. F. Franke, A. S. Kraus.

Marrs-Lingo Motor Company, Dallas, Tex.; $7500; incorporators, A. A. Marrs, D. C. Lingo, J. W. Fox.

Pomeroy Auto & Garage Company, Pomeroy, O.; $2500; incorporators, A. H. Clifton, W. L. Davis, W. T. Dorst, W. N. Davis, P. L. Clifton.

Swap-Beynon Auto Repair Company of St. Louis, St. Louis, Mo.; $2100; incorporators, C. A. Madill, F. W. Swap, Albert Beynon.

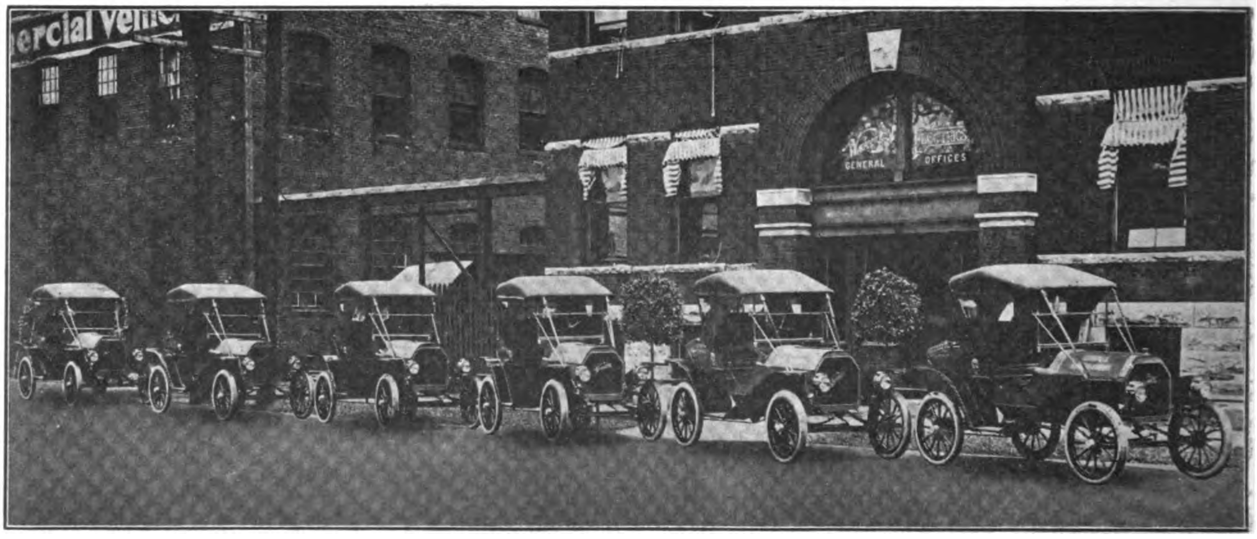
Southern Taxicab Company, Columbus, O.; $10,000; incorporators, James J. Keating, James A. Allen, Jack B. Williams, A. P. Carmichael.

Heath Method Company, Newark, N. J.; $24,000; to manufacture automobile supplies; incorporators, H. H. Wilcox, F. C. Overbury, F. A. Heath.

E. Reineking Automobile Supply Company, Brooklyn, N. Y.; $5,000,000; to manufacture automobiles and their appliances; incorporators, Emil Reineking, John Laugh.

Industrial Motor Car Company, Middletown, N. Y.; $350,000; to manufacture self-propelled vehicles; incorporators, W. A. Courtland, C. W. Jewell, M. C. Crawford.

International Trolleymobile Company, Portland, Me.; $1,000,000; incorporators, Robert E. Ahern, Dennis A. Meaher, Charles H. Gilmore, J. Ralph Wellman, Charles W. Noyes.



Fleet of Waverley Electrics Recently Shipped by Waverley Company, Indianapolis, Ind., to Lighting Concern in Louisville, Ky.

Arter Auto Carriage Company, Cleveland, O.; $20,000; to manufacture motor cars; incorporators, John G. Arter, B. Hexter, James B. Ruhl.

Majestic Rubber Company, Akron, O.; $3000; to manufacture motor car tires; incorporators, E. Christman, A. L. Neiswanger, C. W. Baum, J. H. Ault.

Mack Auto Company, Reno, Nev.; $50,000; incorporators, M. D. Mack, E. D. Mack.

Barlow's Electric Garage Company, Newark, N. J.; $20,000; incorporators, W. W. Scofield, D. A. Barlow, William T. Benjamin.

Faultless Starter Company, Racine, Wis.; to manufacture engine starters; incorporators, C. I. Schoop, J. L. Barker, M. E. Walker.

Warren Street Garage Company, Hudson, N. Y.; $3000; directors, John T. Hester, Henry B. Hester, Dennis Hester, Jr.

Garrison Gasoline Engine Specialties Company, Camden, N. J.; $125,000; to manufacture motors; incorporators, F. A. Kuntz, F. S. Saurman, F. S. Muzzey.

International Automobile League Tire & Rubber Company, Wilmington, Del.; $1,000,000; to manufacture, sell and deal in all kinds of motor vehicles; incorporators, William J. Seltzer, Samuel Morrell, Robert Gibson.

Victor Auto Parts Company, Cincinnati, O.; $20,000; incorporators, William J. Corcoran, Edward S. Corcoran, John L. Corcoran, Harvey B. Corcoran, H. R. Kerana.

A. J. Meyer Motor Car Company, Cedarburg, Ws.; $25,000; incorporators, John Armbruster, Jacob Dietrich, John F. Bruss.

Automobile Supply Company of Illinois, Chicago, Ill.; $10,000; to manufacture automobile supplies; incorporators, Albert Norwald, Samuel Rubinsky, Harry Simmons.

Queen City Cycle Company, Wilmington, N. C.; $25,000; to deal in motorcycles; incorporators, Eugene R. Pickard, James D. Pickard, Dora B. Pickard.

Thirty-Five Percent Automobile Supply Company, Augusta, Me., $1000; incorporators, E. M. Leavitt, M. M. Spinney, E. L. McLean.

United Garage Company, Boston, Mass.; $15,000; incorporators, Jesse Good, James R. Jones, William F. Waters.

C. & C. Auto Company, New York City; $500; incorporators, John H. Wiancimino, E. R. Wiancimino, F. L. Wiancimino, 202 Carrol street, Brooklyn.

WITH THE MANUFACTURER

The Sheboygan Machine Company of Sheboygan, Wis., incorporated recently, is to commence the manufacture of pump jacks and gasoline engines of various types in the old Kohler Machine Company's plant. The company, capitalized for $10,000, has the following officers: President, F. Karste, Jr.; vice president, C. Kummer; secretary, A. L. Steffin; treasurer, L. Nelson. The selling agent is the Carbo Light Com[illegible] Anderson, Ind.

J. M. Ward, who fo[illegible]st two years has been connected with the Waverley Company, Indianapolis, Ind., maker of Waverley electric cars, has accepted a position as assistant sales manager of the American Motors Company, also of Indianapolis, maker of American cars.

F. S. Rowan, who has been engaged in newspaper work along special lines in various parts of the country, particularly in the Southwest, has become advertising manager of the Clarke-Carter Automobile Company, Jackson, Mich., maker of Cutting cars.

The Otto Gas Engine Works, Philadelphia, original manufacturer of the Otto car, has no corporate connection with the OttoMobile Company of Mt. Holly, N. J., which has been acting as sales agent for the past year. It is understood that in the future the Philadelphia concern will handle its own product direct with dealers in this country and abroad.

The Connecticut Telephone & Electric Company, Inc., Meriden, Conn., maker of Connecticut ignition equipment, etc., has established a New England branch office at 224 Pleasant street, Boston, in charge of F. C. Whitman, who has covered this territory for the company during the past few years. The Connecticut Shock Absorber Company of the same city, maker of the Connecticut shock absorber, will occupy space in the showroom.

The Adamson Manufacturing Company, East Palestine, O., has obtained a patent on its vulcanizer, and the plant is being remodelled for the production of the device in larger quantities.

The Chevrolet Motor Company, Detroit, has purchased the plant of the Imperial Wheel Works, Flint, Mich. It is understood that a new building will be erected, which will be operated in conjunction with the present plant in Detroit.

The Havers Motor Car Company, Port Huron, Mich., has purchased the factory buildings formerly occupied in that city by the E-M-F Company, Detroit. The additional structures will enable the company to increase materially its production of Havers cars for 1913.

The Leech Automobile Company, Lima, O., which has been carrying on experiments with a new motor for the past three years, is erecting a new plant for its production. The officers of the company, which is capitalized for $100,000, are: President, Charles M. Leech; vice president, H. H. Hughes; secretary, Frank Leech; treasurer, A. M. Kelchner; general manager, W. H. Allen.

The R. J. Irvin Manufacturing Company, Indianapolis, Ind., maker of automobile bodies and tops, has awarded the contract for a two-story factory building to cost approximately $50,000. Russe J. Irvin, president of the concern, announces that the company also will occupy two other buildings of large dimensions near the site of the proposed new plant.

STEWART MOTOR CORPORATION
STEWART MOTOR CORPORATION

Buffalo Factory That Was Acquired by Stewart Motor Corporation of That City.

The Stewart Motor Corporation, recently organized in Buffalo, N. Y., by T. R. Lippard and R. G. Stewart, who withdrew from the old Lippard-Stewart Motor Car Company, has secured the plant vacated by the Niagara Machine & Tools Works at Randall and Superior streets, in which manufacturing operations will begin at once. An accompanying illustration presents the building, where the new Stewart light trucks will be made.

The Broad-Oak Automobile Company, Columbus, O., has been purchased by R. M. Weaver and W. J. Miller, until recently connected with the Columbus Machine Company. Mr. Miller was superintendent of the machine company and was at one time a member of the Miller-Frayer Automobile Manufacturing Company. Mr. Weaver was general manager.

The Standard Motor Car Company, Scranton, Penn., recently purchased the plot of ground adjoining its plant in Dupont court and is arranging to build a two-story addition of glass and steel. The present buildings are to be torn down.

The Nyberg Automobile Works, Anderson, Ind., maker of the Nyberg line of pleasure and commercial cars, recently entertained the 150 skilled mechanics in its employ at a dinner, at which a number of invited guests discussed matters concerning the welfare of the industry.

The Hampton Manufacturing Company, Hamilton, O., has removed its factory to Indianapolis, Ind., where it will continue the production of interliners for automobile tires.

The American Castings Company, Mishawaka, Ind., has installed new equipment, including molding machines, pneumatic tools and other apparatus, and will increase its force of active workmen.

W. L. Tust, Dubuque, Ia., is president of a new independent oil concern, which is erecting a $25,000 plant in that city.

The Ford Motor Company, Detroit, recently entertained the delegates to the convention of motorcycle manufacturers and dealers in that city, by inviting them to inspect the plant in which Ford cars are produced. An accompanying illustration shows some of the prominent delegates upon this occasion.

The A & M Sales & Service Company has been formed in Indianapolis, Ind., to handle the sales of the American and Marion cars, made by the American Motors Company and the Marion Motor Car Company of that city. The following officers have been named: President, J. I. Handley; vice president and general manager, Thomas L. Marshall; secretary and treasurer, L. R. Wilbur.

The New York Lubricating Oil Company, New York City, has found it necessary to open larger quarters at San Francisco, owing to the increase in the sales of Monogram oil in that territory. An office also has been opened in Spokane, Wash.

The Benz Auto Import Company, New York City, announces a change in management. Paul R. Pelz, representative of the Benz factory in Mannheim, Germany, has become president and treasurer. Paul V. Clodio, for the past two years connected with the company, has taken the position of secretary, succeeding Walter Maas, who has returned to Europe.

A. E. Reid of Toledo, O., has taken the agency for the Overland car, made by the Willys-Overland Company, Toledo, with headquarters at Louisville, Ky. Mr. Reid takes charge of the sales in the city and surrounding territory, which includes nearly 40 counties altogether, taking in three in Southern Indiana. The agency has been located in larger and more commodious quarters than was the case when it was held by the Glosebrenner Commercial Car Company.

The American Ignition Company and the Knop Battery Company, both of Detroit, were merged recently under the name of the Electrolamp Company, for the manufacture of the Knop line of spark plugs and storage batteries, as well as a motorcycle electric lamp. The officers are: President, W. J. Sculley; vice president, N. G. Begle; secretary, C. R. Baxter; treasurer, R. L. Aldrich.

The Cole Motor Car Company, Indianapolis, Ind., maker of Cole cars, has appointed the following agencies: King Auto & Repair Company, Charleston, S. C.; Blodgett Bros., Leads, S. D.; John Christensen & Co., Galveston, Tex.; Gasper Machine & Garage Company, Gasper, Wyo.; Boyle & Jeffe, Cheyenne, Wyo.; Cole & Co., Lander, Wyo.

R. C. Anderson, Racine, Wis., for several years vice president of the J. I. Case Plow Works of that city, has taken the position of general manager of the reorganized Simms Magneto Company, New York City.

George Fitzsimons has resigned as sales manager of the E. R. Thomas Motor Car Company, Buffalo, N. Y.

George H. Lloyd announces his retirement from the Velie Motor Vehicle Company, Moline, Ill., maker of Velie cars. He has been in charge of the sales since the incorporation of the company in 1908.

The Crosby Company, Buffalo, N. Y., manufacturer of automobile frames and stamped metal goods, is building an addition to its plant, 125 by 180 feet. It will be four stories high and of steel frame construction.

The American Top Company, Jackson, Mich., manufacturer of automobile tops, has merged its business into a stock company with a capitalization of $350,000. The company is considering an enlargement of its plant.

The Dayton Body Company, Dayton, O., has purchased a building site upon which a new factory will be erected for the manufacture of automobile bodies.

The Fisk Rubber Company has made E. L. Duffee the manager of its branch in Pittsburg, Penn. The offices are located in Baum street.

The Willard Storage Battery Company, is building an addition to its plant in Cleveland, O. The firm will have, after the building is completed, 25,000 feet of floor space. New offices were recently taken at 5716 Euclid avenue.

The Suspension Roller Bearing Company, Sandusky, O., is to erect a plant east of that of the Sandusky Auto Parts & Motor Truck Company on First street, to cost approximately $30,000.

The Louisville Lighting Company, Louisville, Ky., recently purchased six Waverley electric roadsters, made by the Waverley Company, Indianapolis, Ind., for the use of its trouble department. These are in addition to four light delivery wagons of the same make and for the same service. An accompanying illustration shows the latest shipment, with its equipment to carry tools and supplies for quick repair work.

Sales Manager Benson of the Studebaker Corporation, Detroit, recently announced the promotion of A. H. Brown, manager of the firm's branch in Spokane, Wash., to be the northwestern sales manager. In his new capacity, Mr. Brown will have charge of the distribution of more than $2,000,000 worth of Studebaker cars.

Walter C. Barnes of Springfield, Ill., was recently appointed publicity manager for the Moon Motor Car Company, St. Louis, Mo. Formerly Mr. Barnes was connected with the advertising departments of several newspapers in Illinois, Idaho and Oregon, and for the past year has been with an advertising agency in Chicago.

Fred A. Crooks, was recently appointed sales manager for the American Locomotive Company, Providence, R. I., and New York City, in the New York branch. Mr. Crooks has been identified with the automobile industry for five years, being formerly associated with the Darracq Motor Company and the Palmer & Singer Manufacturing Company.

Members of the Motorcycle Manufacturers' Association Visiting the Ford Motor Company's Plant During Recent Convention in Detroit.

Charles E. Riess of New York City, president of the American-Marion Sales Company, 1896 Broadway, recently closed 1913 contracts with the American Motors Company and the Marion Motor Car Company for the New York district.

The Indiana Garage & Sales Company, 3316 East 15th street, Kansas City, Mo., recently closed a contract with the Lincoln Motor Car Works, Chicago, becoming distributing agent for Kansas City and vicinity for the Lincoln light delivery wagon.

The R-C-H Corporation, Detroit, Mich., maker of R-C-H cars, has closed agencies for 1913 as follows: H. A. Walton and C. W. Ellington, Roswell, Ga.; Dothan Carriage Company, Dothan, Fla.; W. L. Wittich & Co., Pensacola, Fla.; Independent Auto Sales Company, Columbia, S. C.; H. L. Marvil, Waycross, Ga.; H. W. Burrell & D. J. Case, Little Valley, N. Y.; L. H. Farnsworth & H. J. Welcher, Newark, N. J.; A. C. Adams, Elkhart, Ind.; Hansen Auto Company, Dixon, Ia.; G. A. Jacobs, Chicago, Ill.; Reid Motor Company, Quincy, Ill.; A. A. Blakewell, Peru, Ill.; Salem Auto & Repair Co., Salem, O.; J. W. Lytle, Uhricksville, O.; Norman Garage Company, Newcommerstown, O.; William Thorney Auto Company, Denver, Col.; Gagetown Auto Company, Gagetown, Mich.; John Nelson & Son, Ottawa, Kan.; J. C. Vanier, Topeka, Kan.; J. I. Warren, Honey Grove, Tex.; R. A. Minor, San Luis Obispo, Cal.; Blaine Auto Company, Redfield, S. D.; Ralph Prom, Milton, N. D.; Walter P. Cowan, Windom, Minn.; Finch & Stiner, Lakefield, Minn.; E. J. Tisdale, Winona, Minn.; George Haab, Babylon, N. Y.; E. B. Delamater, Poughkeepsie, N. Y.; The Uncas Garage, Norwich, Conn.; E. A. Myers & C. M. Lippincott, New London, Conn.; A. B. Adams, Tuckahos, N. J.; Daniel H. White, Norristown, Penn.; J. F. Wright, Benton, Penn.; G. H. Guerrant, Witt, Va.; D. M. Dorman, Geneva, N. Y.; G. F. Wolter, Dodge Center, Minn.; Vest & Anderson Co., Knoxville, Tenn.; P. Watt Richardson, Greensboro, N. C.; Crane Bros., Machias, Me.; Patterson & Patterson, Yates Center, Kan.; Cowles Toleman, New Haven, Conn.; Rowe & Sikes, Oswego, N. Y.; John B. Hargis, Cleveland, Tenn.; Otis Motor Car Company, South Bend, Ind.; Fletcher & O'Neal, Andalusia, Ala.; A. O. Williams, Luthersville, Ga.; Central Garage, Quincy, Mass.; Hoyt Bros., Ware, Mass.; Fred D. Morse, Portland, Me.; John P. Agan, Danville, Ill.; Clifford Auto Company, Monticello, Ind.; Gus A. Baumetz, Cleveland, O.; Sitgraves & Boyd, Columbus, O.; G. S. Hamnett, Greeley, Col.; Ralph H. Love, Mount Pleasant, Tex.; Clay & Gilmore, Moody, Tex.; Mutual Auto Company, Faribault, Minn.; E. I. Bowe, Huron, S. D.; Olund & Nystrom, Wilmont, Minn.; A. W. Wolten, Austin, Minn.; James J. Duquette and B. F. Moody, Saranac Lake, N. Y.; Minerva Hardware Company, Minerva, O.; Arthur H. Thomas, Pleasanton, Kan.; A. Garnier, Kansas City, Kan.; Bessie Mercantile Company, Bessie, Okla.; James Jepson, Pittsburg, Kan.; George E. King, Atchinson, Kan.; Russell Gates Mercantile Company, Colorado Springs, Col.; Randall Motor Car Company, Ft. Wayne, Ind.; Henry Koenning, Peotone, Ill.; Robbins & Johnson, McCool, Ind.; E. M. Ferry, Wheaton, Ill.; Meeker & Claussen, Crown Point, Ind.; J. E. Hatfield, Bloomington, Ill.; W. C. Smith & Co., Richmond, Va.; Patrie & Morganthall, Greencastle, Penn.; S. H. Daddow, St. Clair, Penn.; Louis L. Larrouche, Pittsfield, Mass.; Philip Marsh, Ft. Plains, N. Y.; Wolf Auto Company, Watertown, S. D.; Meuller & Aab, New Ulm, Minn.; Farley Auto Company, Milbank, S. D.; Bell & Webster, New Richmond, Wis.; Louis Prchal, Le Sueur Center, Minn.; Findeisen Auto Company, Red Lake Falls, Minn.; William F. Holmes, Brockton, Mass.; C. E. Whitten, Lynn, Mass.; Motor Sales & Service Company, Salem, Mass.; M. H. Wood & Co., Webb City, Mo.; George W. Chandler, Hugo, Okla.; H. E. Sombart & Son, Booneville, Mo.; O. E. Houser, California, Mo.; A. Vincent & Son Company, Chicago, Ill.; John Rehm, Chicago, Ill.; George H. Thompson, Morgan, Minn.; Hinton & Byrd, Lumberton, Miss.; J. W. Day, Brookhaven, Miss.; Frank Martz, Plymouth, Penn.; A. Judson Wells, Buffalo, N. Y.; M. L. Shanks, Salem, Va.; T. Clark, Pomona, Cal.; Orme Motor & Transfer Company, Shreveport, La.; Charles B. Scully, Almont, Mich.; C. Crawford & Son, Caseville, Mich.; George J. Moses, West Chester, Penn.; James N. Kemp Machine Works, Albany, N. Y.; Carl W. Patch, Chagrin Falls, O.; Duncan G. Bellows, Zion City, Ill.; Johnson Beattie Auto Company, South Bend, Ind.; J. Carpenter, Ridgeville, Ind.; R. S. Crowder, Sullivan, Ind.; Levi J. Orr, Boswell, Ind.; R. W. Squires, Plattsburg, N. Y.; G. O. Walker, Granville, N. Y.; New Brunswick Garage Company, New Brunswick, N. J.; P. P. Venable, Paterson, N. J.; Franklin Auto Company, Elizabeth, N. J.; Thomas Motor Car Company, Somerville, N. J.; A. W. Sibley, Norton, Mass.; City Hall Garage, Lowell, Mass.; J. P. Plunkett, Red Lodge, Mont.; B. N. Engle, Enderlin, N. D.; R. H. Davis and L. P. Turney, Dallas, Tex.; Samuel N. Chase, Haverhill, Mass.; Louis G. Schoepflin Company, Buffalo, N. Y.; R. Hans Electric & Manufacturing Company, Springfield, Ill.; Knueppel & Ott, Davenport, Ia.; W. F. Wittman, Harvard, Ill.; V. W. Prime, Elizabethtown, N. Y.; J. A. Pinkston, Independence, Kan.

A. Reis Meyer, for a number of years a well known automobile man, recently took a position in the new motor wagon department of the O. Armleder Company, Cincinnati, O.

The Piano & Heavy [illegible] Truck Manufacturing Company, Toledo, O., has been incorprated with a capital stock of $20,000 to manufacture heavy trucks. A. T. Raynor, W. F. Runkle and others are the incorporators.

The Motor Manufacturing Company, Geneva, N. Y., is moving its plant to Dunkirk. David Reed is president of the company and R. J. Hall superintendent.

The Kenton Gas Engine Company has added a motor car repair department to its plant in Kenton, O. The company will handle a full line of accessories as well as the Kenton agency for the Knight tires. T. A. Taylor is the general manager.

The Railroad Motor Car Company, Marion, Ind., was recently formed with a capitalization of $200,000. The purpose of the company will be to manufacture and repair motor vehicles used on railroad tracks. The following are directors: William O. and John D. Worth, Hiram Beshore, George R. Stewart and Eben H. Walcott.

The Frontier Tire & Rubber Company, Buffalo, N. Y., has plans in preparation for an addition to its plant.

The Paris Auto Starter Company, Paris, Ill., has changed its name to the Paris Electric Starter Company, and increased its capital from $10,000 to $100,000.

The Kelsey Wheel Company, Detroit, Mich., manufacturer of automobile wheels, is erecting additions to its plant which will about double its capacity. The new structures will include a main building 180 by 360 feet.

The Cadillac Motor Car Company, Detroit, Mich., is to build a one-story factory building, 70 by 120 feet. The cost will be approximately $15,000.

The Shop of Siebert, Toledo, O., maker of the Siebert truck and automobile bodies, has commenced the erection of a three-story factory building, 75 by 105 feet, of brick and concrete construction.

The Hayes-Ionia Company, Ionia, Mich., manufacturer of automobile accessories, has arranged for the construction of a large addition to its machine shop. Four new dry kilns will be installed.

The Reo Motor Car Company, Lansing, Mich., has plans under way for the construction of several additional factory buildings. The cost will be approximately $100,000.

The Pullman Taxicab Company, Philadelphia, Penn., is preparing to build a new garage to cost approximately $25,000. The building will be 80 by 86 feet, and of fireproof construction.

The Columbus Auto Parts Company, Columbus, O., has purchased the plant formerly occupied by the Jauney Company and will begin manufacturing operations in the immediate future. The directors of the company are: F. H. Penfield, Fletcher Goodwell and Benjamin S. Dean of Jamestown, N. Y., and J. I. Handley of Indianapolis.

The Standard Motor Car Company, Dayton, O., has moved into new quarters at Third and Perry streets, that city, where rooms affording ample accommodations for a rapidly increasing business have been secured. An important and convenient innovation in garage equipment is an immense turntable, upon which a car with 145-inch wheelbase can be turned with ease. The showrooms are also roomy and attractive.

GARAGE & DEALER

The Blackwood Tire & Vulcanizing Company, a new Nashville, Tenn., concern, has begun business in that city. H. O. Blackwood, the proprietor, has taken the Nashville agency for the Fisk tires.

C. J. Witbeck has opened a new garage and agency for the Ford car, made by the Ford Motor Company, Detroit, at Ridgefield, Wash.

The Benjamin Eastwood Estate, Paterson, N. J., has completed plans for a new machine shop and garage to be erected at 18-26 Rampo avenue. The garage will be three stories in height and will cost $35,000.

The Barker Auto Company, Bristol, Conn., has begun operations in the erection of its new garage on Riverside avenue.

William Daly and George A. Boyd have signed a lease for 10 years for a new garage at Wadsworth avenue and 167th street, New York City, at a cost of $40,000.

H. C. Dies of Clinton, Ind., is to erect a garage on East Mulberry street, that city. It will be of brick construction and two stories high.

Mullen & Hunter of Gillmore City, Ia., have secured plans for a garage to be one story high and cost $6000.

Manager J. R. Hall of the Campbell Auto Company, Salt Lake City, Utah, agent for Michigan and Premier cars, has established new headquarters in that city at 49 West Fourth street.

George C. Boldt has awarded a contract for remodelling the quarters at 1401-1403 Locust street, Philadelphia, Penn., to be used as a garage. The new location adjoins his present building at 1405-1407 Locust street.

The Detroiter-Baltimore Company, 2207-09 Madison avenue, Baltimore, Md., recently incorporated for $50,000, has a two-story building 40 by 145 feet, and will deal as agent for the Detroiter line of automobiles, made by the Briggs-Detroiter Company of Detroit, in Maryland, Virginia and West Virginia. The company will also conduct a modern, up-to-date garage and service station, maintaining day and night service. Machinery will be installed for an automobile machine shop. R. H. Croxton is president and Gilbert A. Jarman, secretary-treasurer of the new company.

The Roberts & Sherburne Company, Boston, Mass., composed of Frank Roberts and Edward R. Sherburne, has been formed to take over the agency for the American car, made by the American Motors Company, Indianapolis, Ind., and salesrooms have been opened at 121 Massachusetts avenue.

The Standard Garage Company, Charlotte, N. C., has opened one of the best equipped garages in the state, and has taken agency for Pullman cars, made by the Pullman Motor Car Company, York, Penn.

Charles Lord has opened salesrooms and a service station at Sanford, Me., where he will handle the Peerless, Pope-Hartford, Stevens-Duryea and Paige-Detroit lines.

The A. R. Wilson Company, Hartford, Conn., has awarded a contract for the erection of a new four-story garage at 341 Trumbull street.

The Malden Electric Company, Malden, Mass., is to erect a new garage on Middlesex street at a cost of $15,000. It will be modern in every respect and equipped with all the latest appliances.

H. A. Testard, New Orleans, La., has signed a long term lease of a new three-story building to be erected at Baronne and Rudido streets, in that city, where he will handle Hudson cars, made by the Hudson Motor Car Company, Detroit.

Don P. McClure has purchased the garage established at Oskaloosa, Ia., by Anderson Bros., and will operate it in conjunction with the general jobbing business conducted at Second street and A avenue. This branch retail salesroom will be in charge of E. Dorman, who has had 22 years' experience as travelling accessory salesman for this house.

The Cole Motor Car Company, Indianapolis, has new representation in Omaha under the name of the Cole Motor Company. E. E. Butler is in charge of the new branch, which is temporarily located at 1102 Farnum street.

Keohler & Hanson has purchased two store properties at Odebolt, Ia., and will build a cement block garage.

The Co-Operative Motor Company, Long Beach, Cal., has secured plans for a new two-story garage to be of brick and concrete, representing an investment of $100,000.

The North River Garage, Inc., New York City., is to erect a one-story garage on West 26th street, at an estimated cost of $15,000.

M. H. Perin has secured a permit for a garage of brick and stone two stories in height, at Cincinnati, O. The structure will cost $23,000.

The Autocar Company, Ardmore, Penn., has taken a 10 years' lease of a four-story garage at 418 Washington street, Newark, N. J.

The W. J. Burt Motor Car Company, Los Angeles, Cal., has taken a 10 years' lease of a new garage and salesroom which is to be erected by Dec. 1.

J. B. Pell has leased the garage recently built at Corcoran, Cal., and is installing new machinery.

The Automobile Supply Company, Miami, Fla., has opened a garage on Sullivan street, that city. The concern will deal in supplies.

M. G. Van Nice has established a garage at Murray, Ia. In addition to conducting an agency for the Marathon, Moline and Cutting cars, he will do repair work and carry a line of supplies.

The Chicago Electric Motor Car Company, Chicago, has taken a lease for five years of a one-story building on South Morgan street.

W. A. Newby and E. D. Barels have formed the Newby Automobile Company, Wall Lake, Ia., and have purchased the garage formerly owned by H. J. Jensen.

Pierce Bros., South Pasadena, Cal., has moved into a new garage, features of which are a repair shop, vulcanizing department and women's waiting room.

Smith & Furnas, Letts, Ia., engaged in the automobile business, has dissolved partnership and L. J. Turner has joined the firm, which will hereafter be known as Smith & Turner.

G. Duithuis has purchased the stock of automobile supplies, garage and repair shop formerly conducted by Palmer & Gilley, Parkersburg, Va.

The Winkler Auto and Supply Company has opened a garage and vulcanizing plant at Chanute, Kan.

The Elton Auto & Repair Company, Youngstown, O., is erecting a modern garage in which to locate its business.

F. G. Withrow and G. E. Finch, agents for the Republic tires, have opened a tire repair shop at Grand Rapids, Mich.

P. W. Devendorf, owner of a garage at La Fargeville, N. Y., has taken control of the Arsenal Street Garage at Watertown, N. Y. He will conduct both establishments.

The Cutting Auto Sales Company, Rochester, N. Y., will build a garage in that city, a feature of which will be a row of stalls with iron grating doors, in which owners may leave their cars and keep the keys.

The Anna Motor Car & Livery Company has opened a garage at Cairo, Ill., which is in charge of R. O. Buford, recently of the Studebaker factory in Detroit.

F. C. Abrams, who recently acquired the San Diego, Cal., agency for the Rambler cars, has established headquarters in that city.

The Jefferson Garage Company, Inc., Syracuse, N. Y., is reconstructing into a garage the Freeman block, recently partially destroyed by fire. The alterations will cost $10,000.

The Kaukauna Motor Sales Company, organized by T. W. McFarlane, Green Bay, Wis., has opened a garage in that city. The agency for the Marathon cars also has been secured.

The Western Auto Company, St. Paul, Minn., has opened a new automobile repair shop at the corner of Rice and Fuller streets in that city.

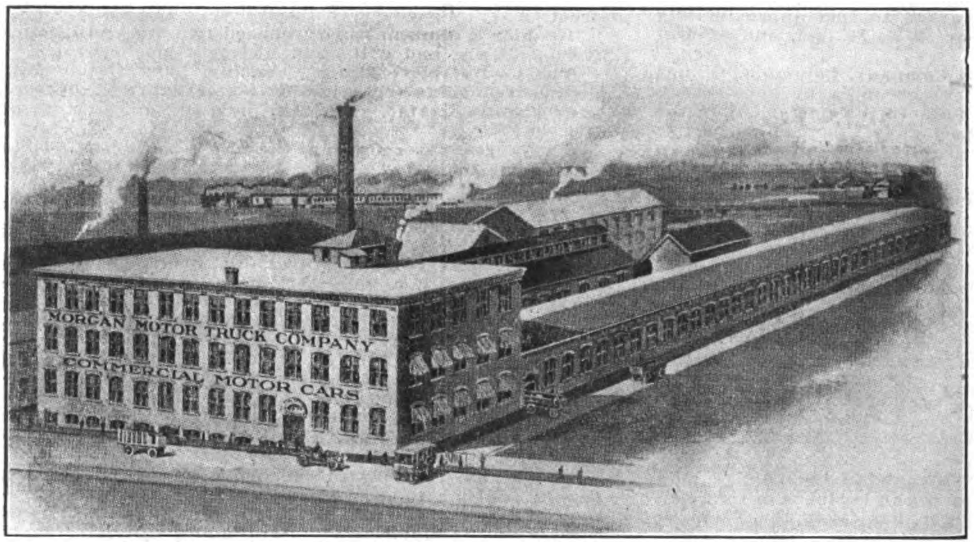
The Yuba machine shop and garage at Marysville, Cal., has been opened to the public.

J. M. Jones & Sons, Manchester, Mo., is to enlarge and improve its plant this fall. The concern operates the Main Street Garage.

The Co-Operative Motor Company, Los Angeles, Cal., will soon build a two-story brick and concrete garage in that city at a cost of $100,000.

The Brown-Symonds Company, distributor of the Stutz car, made by the Ideal Motor Car Company, Indianapolis, will move into new quarters on Pico street, Los Angeles, Cal., in the near future. Plans have been completed for one of the most complete garages and salesrooms in the West, the proposed building being of brick and two stories high. The showroom will be of tile and mahogany. Frank Kincaide, formerly final tester at the Stutz factory, will have charge of the well equipped machine shop.

George T. Burdeau, real estate operator in St. Louis, Mo., has signed a 10 years' lease with A. M. Zerweck of East St. Louis, representative of the Warren Motor Car Company, Detroit, for the lot at 3048 Locust street, St. Louis, at $1800 a year. One of the most modern show and salesrooms in the country will be erected on the lot, the area to be covered being 42 by 126 feet. D. W. Iseminger, special western representative of the Warren company, assisted in the negotiations to secure the property.



Factory of the Morgan Motor Truck Company, Worcester, Mass.

The J. W. Maguire Company, Boston distributor for the Pierce-Arrow motor cars, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y., has secured the store adjoining the present quarters and the plant will be materially enlarged, the entire establishment, salesrooms and service station, occupying more than 6000 feet of floor space.

J. B. Sloan of the Sloan & Mason Tire Co., which is equipped to do any work in vulcanizing and repairing of tires, has purchased the interest of his partner, Thomas Mason, and will conduct the business at Jacksonville, Fla., under the same firm name.

The Burns-Ramsden Automobile Company, St. Louis, Mo., agent for the Rambler machine, made by the T. B. Jeffrey Company, Kenosha, Wis., will soon occupy salesrooms at 5033 Delmar boulevard, St. Louis. A garage and repair shop will be in the rear of the offices.

The White Automobile Company, Baltimore, Md., formerly agent for White cars, has been merged into the White Company, which will in future conduct a direct factory branch in that city.

The Corinth Auto Company, Corinth, Miss., will erect a building to be equipped with light machine tools for automobile repair work.

W. F. Siegmund is at the head of the Detroit Electric Car Company, which has been formed at St. Louis, Mo., to take over the business of the branch, discontinued some time ago.

Arthur E. Wheeler has opened a garage and salesroom at Syracuse, N. Y., it being his purpose to handle the Stoddard-Dayton and Haynes pleasure cars and line of trucks.

George Meeley, who maintains a garage at Philadelphia, has established in that city a tire sales office.

Philip Le Page of Methuen, Mass., has opened a new garage on Lowell street.

Fred Crosby, Syracuse, N. Y., owner of the garage formerly occupied by the Kerr-Doane Motor Company and the American Sales Motor Company, is planning a three-story addition to the establishment. He will install an elevator having a capacity of 10 tons.

L. E. Huddle, manager of the Overland garage at Lancaster, O., has leased the building adjoining it for an addition to his present plant.

The Regal & Metz Motor Company has taken over the garage and building formerly occupied by the Acme Garage Company at Worcester, Mass.

The Ohio Auto Repair Company, Cincinnati, O., has taken the agency for the Imperial car, made by the Imperial Automobile Company, Jackson, Mich., which enters Cincinnati for the first time.

Daniel Conway, Jr., and James N. Bussey have formed a partnership at Troy, N. Y., to establish an agency for the R-C-H car, made by the R. C. H. Corporation, Detroit.

Eugene L. Caton and L. D. Brewster are now the Worcester, Mass., representatives of the Pope Manufacturing Company, Hartford, Conn., maker of the Pope-Hartford car.

Richard C. Plater has purchased the site at Vauxhall street and Broadway, Nashville, Tenn., embracing 20,000 square feet, upon which he will build the largest garage in the state, to adjoin new stores and a hotel, which also are being planned.

William M. Hall, George W. Kilpatrick and Joseph C. Bily, Pittsburg, Penn., are to make application to the governor of Pennsylvania for the charter of an intended corporation to be called Gardner Garage & Supply Company. A general garage business will be conducted.

The N. C. Corbitt Automobile Company, Henderson, N. C., is planning the erection of a one-story factory building, 60 by 510. The building, it is said, will cost approximately $20,000.

The Colonial Motor Company is having a two-story garage erected at North avenue and Lovegrove street, Baltimore, Md. The building will be of ornamental concrete and brick.

The J. M. Dunn Auto Company, incorporated with J. M. Dunn as president and manager, Parker Barrett, vice president, and J. F. Dunn, secretary and assistant manager, has taken over the M. & F. Garage, Bakersfield, Cal., from Mason & Flickenger, and will continue to carry on a general garage and automobile supply and service station.

The Marathon Motor Sales Company has been formed at Baltimore, Md., to take the agency for the Marathon car, made by the Marathon Motor Works, Nashville, Tenn.

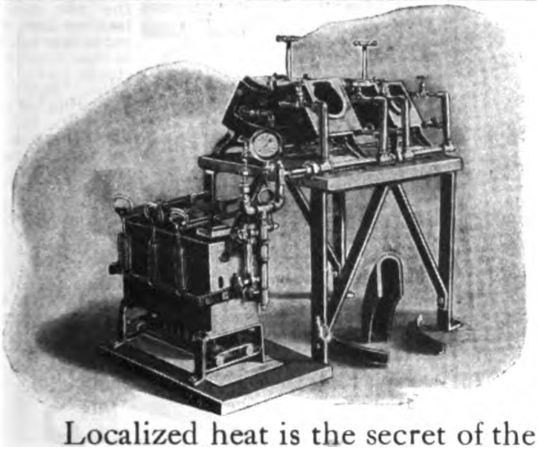
The Painter-Dunn Company is the reorganized name of the Robinson-Painter Company, the Pittsburg, Penn., representative of the Willys-Overland Company, Toledo, O., maker of Overland cars. Thomas F. Dunn, the junior partner, has had a wide experience in handling various lines of automobiles. He was formerly vice president and general manager of the Maxwell-Briscoe Pittsburg company and also of the United States Motor Company. The new firm starts under exceptionally favorable circumstances.

Charles E. Riess, president of the American-Marion Sales Company, New York City, is closing up contracts throughout the New England states with agents for American cars. He will cover every mile of New England territory in order that the company may be adequately represented in that section of the country.

G. E. & H. J. Habich Company, Boston, Mass., state distributor for the Cole car, made by Cole Motor Car Company, Indianapolis, Ind., recently increased its sales force by the addition of Edgar A. Ordway, one of the best known automobile salesmen in the East.

M. M. Spear and W. L. Tozier have taken a lease of the garage building on the causeway, opposite the depot in Gardiner, Me., and have opened a general accessory business.

The Emil Grossman Company, New York City, will not renew its contract for the sales management of the Vanguard Manufacturing Company, Joliet, Ill., and hereafter will confine its energies to the manufacture of its Red Head spark plugs and other specialties.



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Casing Repair Vulcanizers
Air Compressors and Tanks
Steam Boilers
Inside Patch Vulcanizers
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Tube Repair Vulcanizers
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It prevents any water entering the spare tire (either from rain or hose used in washing.) Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

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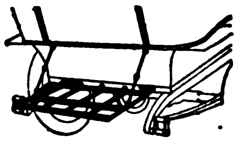

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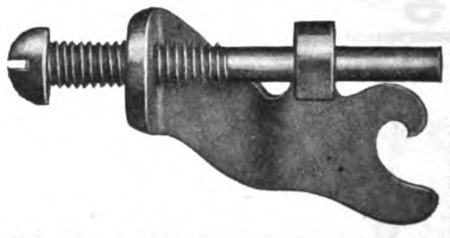

Hook the tool over the outer edge of tire rim, between the two ends of locking ring. Push valve tube into rim so that locking lug clears inside of Shoe. Screw the bead ring off locking ring. It holds the rings apart, leaving both hands free to remove the locking ring. Nickelled and case hardened, it weighs 2 1-2 oz. If not carried by your dealer, mailed prepaid in the U. S. on receipt of 65c P. O. or EXPRESS MONEY ORDER, or 75c on check requiring collection charge.

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Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Bi-Motor Equipment Co., 177-179 Portland St., Boston, Mass.
Branch: 113 Massachusetts Ave., Boston.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York.

Miller, Chas. E., 97-103 Reade St., New York.
Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York, 1421 Bedford Ave., Brooklyn, N. Y.; 818 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 66 Edgewood Ave., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

Marbury Bros., Inc., 1786 Broadway, New York. (S. R. O.)

New Departure Mfg. Co., Bristol, Conn. (New Departure.)

BATTERIES.

Geiszler Bros. Storage Battery Co., 514 W. 57th St., New York.

Lincoln Electric Co., 1007 Atlantic Ave., Brooklyn, N. Y. (Hi-Po Waterproof Dry.)

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind., South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston; 237 Lafayette St., New York.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Mayer Carburetor Co., 2673 Main St., Buffalo, N. Y. (Mayer.)

Sumner, George, Inc., 1841 Broadway, New York; 755 Boylston St., Boston. (Rayfield.)

CARS—GASOLINE PLEASURE.

Brush Runabout Co., 3 West 61st St., New York. (Brush runabout. Liberty-Brush.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)

Cutting Motor Car Co., Jackson, Mich. (Cutting.)

Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.

Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (E-M-F, Flanders.)

United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st St., New York. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Federal Motor Truck Co., Junction & Leavitt Sts., Detroit. (Federal.)

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Peerless Motor Car Co., Cleveland, (Peerless.)
Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Stewart Motor Corporation, Buffalo, N. Y. (Stewart.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st St., New York. (Sampson, Brush, Stoddard.)

V. C. Motor Truck Co., Lynn, Mass. (V. C.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

Westfield Motor Truck Co., Westfield, Mass. (Westfield.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., Detroit. (Anderson.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

BUYERS' GUIDE---Continued

United States Motor Co., 8 West 61st St., New York. (Sampson.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)

Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.

Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

J. & B. Manufacturing Co., Pittsfield, Mass. (Type J. C.)

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CUSHIONS.

Leavens & Co., Wm., 32 Canal St., Boston. (Leavens Shock Absorber.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Automobile Supply Manufacturing Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston. (Jericho, Jubilee.)

IGNITION DEVICES.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Master Vibrator.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City.
Branches: 1700 Broadway, 212-214 W. 88th St., New York; 325 Columbus Ave., Boston; 1437 Vine St., Philadelphia; 1458 Michigan Ave., Chicago: 289 Halsey St., Newark, N. J.; Bretton Woods Garage, Bretton Woods, N. H.; 1524 Grand Ave., Kansas City, Mo.: 803 Woodward Ave., Detroit; 448-450 No. Capitol Blvd., Indianapolis.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

Morse, Frank W., 516 Atlantic Ave., Boston.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)

Geiszler Bros. Storage Battery Co., 514-520 W. 57th St., New York.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Light Regulator.)

Remy Electric Co., Anderson, Ind. (Remy.)

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Haws, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Bldg., Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia. (Invader.)
Branch: 284 Columbus Ave., Boston.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia; 1436 Michigan Ave., Chicago; 1111 Superior Ave., N. W., Cleveland; 435 Turk St., San Francisco; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; Spokane, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Standard Oil Co., New York. (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York.
Branches: Boston Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 605 Brown Bros. Bldg., Philadelphia; 154 Exchange St., Bangor, Me., 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.

Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)

Kimball Manufacturing Co., Motor Mart, Boston. (Mea.)

Marburg Bros., 1786 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: 18-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; Mass. Ave. & St. Germain St., Boston; 430-36 Van Ness Ave., San Francisco; 868 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.; S. W. Cor. Cherry & Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; Seattle, Wash.; London, Eng.; Buenos Ayres.

MATS.

Sidwell Pedal Mat Co., 245 Columbus Ave., Boston. (Pedal.)

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

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American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

Emblem Manufacturing Co., Angola, N. Y. (Emblem.)

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Swenson, B. A., 298 Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Hazard Motor Manufacturing Co., 789 Coates St., Rochester, N. Y. (Hazard.)

Rutenber Motor Co., Marion, Ind. (Rutenber.)

PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

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Randall-Faichney Co., Boston. (B-Line.)

PUMPS, TIRE.

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 436 South Dearborn St., Chicago.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.

Hartford Suspension Co., 146 Bay St., Jersey City. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Elliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York; 55 Boylston St., Boston. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Janney, Steinmetz & Co., Philadelphia.

Kimball Manufacturing Co., Motor Mart. Boston. (Lodge Double-Pole.)

Randall-Faichney Co., Boston. (Mac-Kae.)

Progressive Manufacturing Co., The, Torrington, Conn. (Black Eagle.)

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: See Magnetos and Magneto Supplies.

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston. (Mac-Kae Universal.)

SPEEDOMETERS.

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 829 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle. Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland.

SPROCKETS.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Carbo-Light Co., 51st and Butler Sts., Pittsburg, Penn. (Carbo-Light.)

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

Page-Lester Co., 129 W. Van Buren St., Chicago. (Tite-Wad Rubber Putty.)

Perfection Filler Co., 421 Old South Bldg., Boston. (Perfection.)
Factory: Somerville, Mass.

TIRES—CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park Sq., Boston; 1731 Michigan Ave., Chicago; 905 First Ave., South, Minneapolis; 1529 Cleveland Place, Denver; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco; 917 E. Pike St., Seattle; 316 North Broad St., Philadelphia; 1197 Broadway, New York; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit; 1616 Grand Ave., Kansas City.

Dayton Inner Tire & Manufacturing Co., 17 Madison St., Dayton, O. (Dayton.)

Diamond Rubber Co., Akron O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Cararact Rubber Co., Wooster, O. (Cataract.)
Branches: Boston, New York, Providence.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Philadelphia, Chicago, Kansas City, Cleveland.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tires—Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS. (See Cars, Commercial.)

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Manufacturing Co., 1756 Cranston St., Providence.

TURNTABLES.

Beach Co., T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

Canton Foundry & Machine Co., Canton, O. (Universal.)

Portland Garage, Portland, Me., (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WASHING DEVICES.

Perfect Manufacturing Co., Albany, N. Y.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WIRES AND CABLES.

Diamond Rubber Co. of N. Y., Akron, O. (Diamond.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

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U. S. MOTOR'S REORGANIZATION PLANS.

KisselKar Acquires Additional Plant in Milwaukee---Branch Factory for Swinehart Tires---Empire Line Increases Production Capacity---Two New Buildings for Remy Magnetos---Promotions for Department Heads.

The situation with reference to the financial condition of the United States Motor Company, New York City, capitalized for $42,500,000, was brought to a decided head Sept. 12, when the Brown & Sharpe Manufacturing Company, Providence, R. I., filed a bill of complaint in the United States court of equity, alleging that the concern was insolvent and asking for the appointment of a receiver. Later that same day Judge Charles M. Hough of the United States district court for the southern district of New York, appointed W. E. Strong, a representative of the banking interests and recently chosen a director of the United States Motor Company, and Robert Walker, an attorney, as receivers. These men have instructions to continue the business of the concern and report to the court by Oct. 28. Still later the same men were appointed ancillary receivers to look after the business of the various subsidiary companies.

The present difficulty had its origin some time in June, when it became known that the company would be unable to meet some $750,000 in paper then due, and an extension of 90 days was granted by a creditors' committee. At that time an advisory committee was appointed, some of the members being representatives of the financial interests involved, its object being to continue the business and to give equal protection to all creditors. This grace period expired Sept. 13.

Several plans for reorganizing the company, or at least of refinancing it were considered by the advisory committee, and a number of interviews were granted in which it was stated that the condition of the company was such that if it could secure necessary money all difficulties would be met. It is stated that the action of the Providence concern was taken with the approval and at the request of a majority in amount of the entire indebtedness, representing claims of some $7,000,000. The Brown & Sharpe company is a creditor for $70,000 in merchandise.

According to the petition the liabilities of the company are estimated at $12,250,000, consisting of $6,000,000 of debenture bonds and claims against the company by banking interests and for merchandise totalling $6,250,000. The assets are claimed to be valued at $15,000,000, these consisting of cash, bills receivable, etc., and are held to be embarrassed by the factory plants of the subsidiary companies, which are scheduled at $6,250,000, against which there is a mortgage of $200,000. Quick assets of July 31 are said to be $9,250,000, of which $4,000,000 represents factory inventories and the remainder cash in hand and bills receivable.

The suit involves all of the subsidiary companies, including the Maxwell-Briscoe Motor Company, Tarrytown, N. Y.; Columbia Motor Car Company, Hartford, Conn.; Dayton Motor Car Company, Dayton, O.; Brush Runabout Company, Detroit, and Alden Sampson Manufacturing Company, Detroit. It is understood that the capital stock of the E. R. Thomas Motor Car Company, Buffalo, N. Y., also was acquired by the United States Motor Company, some time within a year, and as this concern already is in the bankruptcy court it appears to be difficult to determine just how the suit affects this. There also are a number of companies engaged in manufacturing parts, etc., which are subsidiary concerns of the United States Motor Company.

It is stated that all of the subsidiaries, with the possible exception of the Brush Runabout Company, and of course, the E. R. Thomas Motor Car Company, are continuing production in about the same manner as they were 90 days ago. The receivers are said to have obtained permission from the court to advance sufficient money to meet the payrolls at the various plants from the general funds of the company and to make provision for administration.

Briefly stated, it would appear that the total indebtedness of the United States Motor Company is divided into two classes, the first of which is represented by commercial paper bearing two indorsements, one by the parent organization and the other by at least one of the subsidiary companies. The other class has paper with only one indorsement, and it is stated that practically all of the claims for merchandise are of this class.

Under the receivership action there are held to be two courses of action open to the company. The first is reorganization under some plan that will take care of the creditors and permit the company to secure sufficient working capital to manufacture and sell its product. It is stated that about $5,000,000 is needed for these purposes. The other course is a sale in open court.

The committee is still at work formulating a plan for reorganization, and any attempt to state the amount of assessment or the method proposed is held to be premature by the committee. However, some mention has been made of a possible assessment of $20 or $25 a share, which former figure is said to be sufficient to raise about $4,600,000. At $25 a share, some $5,750,000 would result, and this is held to be sufficient for all present needs.

According to the petition filed in court it would appear that the subsidiary companies are indebted to the parent organization and are liable as makers or indorsers of notes as follows:

Alden Sampson Manufacturing Company.	
United States Motor Company	$1,069,278.72
Notes and accounts	50,014.13
Total	$1,119,292.85
Brush Runabout Company.	
United States Motor Company	$1,027,663.38
Notes and accounts	6,650.29
Total	$1,034,313.67
Columbia Motor Car Company.	
United States Motor Company	$256,134.23
Notes and accounts	149,406.92
Total	$405,541.15
Dayton Motor Car Company.	
United States Motor Company	$2,045,358.72
Notes and accounts	416,578.67
Total	$2,461,937.39
Maxwell-Briscoe Motor Company.	
United States Motor Company	$69,929.83
Notes and accounts	1,909,949.25
Total	$1,979,879.08

The total money on hand and receivables of the subsidiaries on Sept. 7, 1912, according to the same source of information, were as follows:

Alden Sampson Mfg. Co	$40,315.79
Brush Runabout Co	79,787.21
Columbia Motor Car Co	31,036.02
Dayton Motor Car Co	247,252.69
Maxwell-Briscoe Motor Co	282,761.27

WILL REMOVE TO MILWAUKEE.

Maker of KisselKar Acquires Additional Plant, Which Will Double the Output.

The most important move in the history of the Kissel Motor Car Company, Hartford, Wis., maker of KisselKar pleasure and commercial lines, was announced Sept. 25, when it was made known that the company had acquired an additional plant at Milwaukee. The new factory has floor space of 200,000 square feet, and it is stated that this will be sufficient to double the output of the concern. It is understood that the general offices will be removed to Milwaukee and additional details of the move will be awaited with interest.

It has been known for some time that in spite of the fact that two commodious buildings recently were added to the Hartford plant, the production facilities were by no means adequate for the increasing demand for KisselKar pleasure vehicles and trucks. Double the early orders of 1912 have been booked for the 1913 season. It is interesting to note in this connection that the Kissel Motor Car Company has enjoyed a wonderful expansion during the past six years, the capital stock having been increased from $50,000 to $100,000 in that time, besides doing a splendid business in the two lines represented by it.

ESTABLISHES BRANCH FACTORY.

Swinehart Tires to Be Produced in Large Quantities in New St. Louis Plant.

J. A. Swinehart of Akron, O., has made the announcement that a factory and distributing station will be established at St. Louis, Mo., for Swinehart tires, the new company being capitalized at $500,000, all of which, except that provided by Mr. Swinehart, has been subscribed by St. Louis capitalists. A building in the centre of the city, near the motor row, has been secured and it is expected that the value of the annual output of the new plant will be $1,000,000.

The inducements which are said to have operated strongly in establishing the St. Louis factory, were the cheap electric power from Keokuk dam, low cost of coal, the excellent water supply, the advantage of St. Louis as a distributing point and excellent labor conditions. It is pointed out that rubber comes from South America mostly and with the opening of the Panama canal it can be shipped to St. Louis on attractive terms, making that city superior to an eastern location. Besides making the full line of solid and pneumatic tires and inner tubes, the company will feature the Krots tire, a solid member for light delivery wagons and electric broughams.

ACQUIRES NEW PLANT.

Empire Automobile Company Prepares for Splendid Year's Business During 1913 Season.

The Empire Automobile Company, Indianapolis, Ind., manufacturer of the Empire line, has contracted for the building of 5000 Empire touring cars and roadsters during 1913. The programme as prepared provides for the manufacture of the product at three points, one at Greenville, Penn., another at Knightstown, Ind., and the third in the largest factory, Connersville, Ind.

The first move in the realization of the project to increase the output of the Empire machines was made when the stock and machinery of the Connersville Wheel Company was purchased recently by the Muncie Wheel Company, Muncie, Ind. The latter company is to move the machinery of the Connersville plant into its own factory at Muncie, thus making room for the occupation of the Connersville buildings by the Empire company. Before its sale the Connersville Wheel Company was owned by W. B. Anstead, E. W. Anstead, C. C. Hall, M. R. Hall and J. M. Heron.

These men also control the Central Manufacturing Company, Rex Buggy Company, Indiana Lamp Company and the Anstead Spring & Axle Company, all Connersville enterprises, through which are produced nearly all the parts which enter into the Empire automobiles. Last year the parts were shipped to the factory at Greenville, Penn., where they were assembled, but the evident advantage of having an Empire factory located in the same city where most of the parts were manufactured resulted in the deal between the wheel concerns.

Since the completion of that deal the Empire Automobile Company has entered into a contract with W. B. and E. W. Anstead, C. C. and M. R. Hall and J. M. Heron for the building of the Empire cars for a period of five years. Besides the building vacated by the wheel company, two new buildings are under construction and deliveries from the plant are expected by November.

This season 2000 cars will be built there by June 1, 1913, 2500 at Greenville and 500 at Knightstown. The Empire company was reorganized this year with additional capital and with C. E. Gibson as general manager.

WORKING DAY AND NIGHT.

Many New Structures Urgently Needed to Take Care of Goodyear's Increasing Business.

As an indication of the wonderful growth of the Goodyear Tire & Rubber Company, the new buildings now in course of construction afford ample conception of the progress made in the past two or three years. In addition to those recently completed other structures to accommodate the increased business are being erected. A new office building, modern in every particular and housing 500 employees, was occupied recently, thus relieving the congestion which previously existed.

Adjacent to the old administration building is a new two-story garage, almost completed, with an extra story at the front to be used as an assembly room. The structural iron work of the new No. 6 building also is nearing completion. This factory will be 403 by 80 feet and will be six stories in height with a basement. Excavations are being made for a new five-story building measuring 250 by 60 feet and an extension 325 by 40 feet is being made to building No. 14.

These three structures are expected to be completed by the end of the year and will be utilized to meet the increased demand for automobile tires, bringing the capacity of the plant up to 8000 automobile tire casings a day. Two stories have been added to No. 13 shop, making it a five-story structure and increasing the capacity of tire output. The Goodyear plant is now working night and day turning out its product.

DAY JOINS GENERAL MOTORS.

Former Head of Mitchell Sales Force to Conduct Motor Truck Business.

William L. Day, General Manager. General Motors Truck Company.

The automobile world was much interested in the announcement by President Thomas Neal of the General Motors Truck Company, Pontiac, Mich., that William L. Day, formerly general sales manager, Mitchell-Lewis Motor Car Company, Racine, Wis., had been elected vice president and general manager. Mr. Day accepted the appointment and resigned from the Mitchell-Lewis Company, the resignation taking effect the first of this month.

Previous to his advent in the automobile business, Mr. Day was for 27 years a prominent figure in the implement industry, being associated in an official capacity with the Parlin & Orendorff Plow Company, Kansas City, Mo. He bears the reputation of being an able and efficient executive and his years of marketing and production will be invaluable in his new duties.

TWO NEW BUILDINGS.

Contracts for 1913 Remy Magnetos Make Necessary Substantial Factory Additions.

The Remy Electric Company, Anderson, Ind., has broken ground for two additional new fireproof buildings to its plant, which are expected to be completed and fully equipped within two weeks. This substantial addition was made necessary by the great volume of magneto business for which the Remy company has contracted with car manufacturers for the 1913 season.

The new buildings will give the concern an increase of 10,600 square feet of floor space. The Remy company claims its factory is the largest of its kind in the world, employing over 1000 men and working day and night shifts. The company also makes the statement that during the next 12 months it will deliver more magnetos to the automobile trade than all other makers combined.

GOES WITH CHASE TRUCK.

R. B. Curtiss Leaves Royal Equipment Company to Manage Chase Branch in Cleveland.

Royal B. Curtiss, formerly sales manager of The Royal Equipment Company, Bridgeport, Conn., has become district manager of Chase Motor Truck Company, Syracuse N. Y., maker of the Chase truck, with headquarters at Cleveland, O. Mr. Curtiss will have jurisdiction over territory embracing Ohio, West Virginia, Kentucky, Indiana, except in the vicinity of Chicago, Michigan and the western part of the state of Pennsylvania.

Royal B. Curtiss, District Manager, Chase Motor Truck Company.

Mr. Curtiss is well known to many who are interested in the manufacture of motor cars or accessories and he has the well wishes of many friends in his new connection with the Chase company. He regretted sincerely being obliged to sever his relations with the Royal Equipment Company, but the idea of connecting himself with the delivery wagon feature of the industry appealed to him strongly. He is succeeded as sales manager of the Royal company by Mr. Everitt.

ANOTHER TRUCK CONCERN.

Brockway Company to Produce Three-Cylinder, Two-Cycle, Air-Cooled Models.

The Brockway Motor Truck Company, Cortland, N. Y., has recently been incorporated with a capital of $100,000 for the purpose of manufacturing a line of popular priced, high grade commercial motor trucks, of which three models will be made with load carrying capacity of 1000-1500 pounds, 2000-2500 pounds and 3000-4000 pounds, respectively. The officers of the company are: President, George A. Brockway; vice president, C. S. Pomeroy; treasurer and general manager, F. R. Thompson.

George A. Brockway, president of the concern, is well and favorably known throughout the United States as a successful manufacturer of high grade carriages and wagons, at present being also president of the W. N. Brockway Company, Homer, N. Y., a company known in this country for over 60 years. The Brockway trucks will also be a high grade product, manufactured to rival the quality of the horse drawn vehicles made in the past.

Rodman S. Reed is chief engineer and superintendent of the company, in which capacity he was formerly connected with the Chase Motor Truck Company, Syracuse, N. Y., for six years. Every part of the Brockway vehicle, including the motor, which is a three-cylinder, two-cycle, air-cooled unit, is built in the new plant under the supervision of widely experienced engineers.

THE NEW YORK SHOW.

Application Blanks Are Issued and Plans Call for Two Big Displays in One.

Like the automobile shows of the last two years the forthcoming exhibition at New York, to be held Jan. 11-25, will be two shows in one, in both the Grand Central Palace and Madison Square Garden. During the time between Jan. 11 and 18, known as the Part 1 period, passenger carrying or pleasure vehicles will be shown in both buildings and during the Part 2 period, from Jan. 20 to 25, commercial vehicles will be displayed in the same manner, while accessories will be exhibited during the two weeks.

The show committee of the Automobile Board of Trade, under whose direction the exhibition will be held, has been working on the details since early spring. It will be the 13th national automobile show and application blanks for exhibition space were issued a few days ago. Judging by the requests, which have been received rapidly, the indications are that the show next winter will eclipse any exhibition of its kind ever held. Merle L. Downs, secretary of the show committee, 7 East 42d street, New York, has increased his staff of employees in order to meet the demand for information and application blanks. A plan of decoration for both the Garden and the Palace is being worked out, which will be unusually attractive.

REMOVE CARBURETOR PLANT.

Marvel Company Interests Flint Capital and Purchases Building in That City.

The Marvel Carburetor Company, Indianapolis, Ind., which recently accepted a proposition of the Flint Board of Commerce, has completed the removal of its plant from Indianapolis to Flint, Mich., and manufacturing operations in the new factory have been begun.

Several Flint business men have become financially interested in the company, the management of which still remains in the hands of A. G. Schonacker. The new plant is a three-story building on Mill street, 50 by 150 feet, and a total output of 300 carburetors a day will be accomplished.

CONSIDERING SALES METHODS.

National Convention of Automobile Sales and Advertising Men for Indianapolis.

An idea which originated with President J. J. Cole of the Cole Motor Car Company, Indianapolis, is to result in the holding of a national convention of automobile sales and advertising men in that city, Oct. 8-9. The main object is to discuss ideal salesmanship, and it is expected that between 3000 and 4000 men connected with the industry will attend the sessions. While the programme is by no means complete, it is announced that the following will deliver addresses:

E. LeRoy Pelletier, director of publicity, Flanders Manufacturing Company, Pontiac, Mich.; A. D. Sheldon, president, Sheldon School of Scientific Salesmanship, Chicago; John Lee Mahin and W. D. Nesbit, Mahin Advertising Company, Chicago; John Wetmore, Evening Mail, New York City; A. W. Shaw, publisher, System Magazine; C. F. Kettering, Dayton Engineering Laboratories Company, Dayton, O.; David Beecroft, Class Journal Publishing Company, New York City; Elbert Hubbard, East Aurora, N. Y.; Will P. Brown, Brown Motor Car Company, Peru, Ind.; E. A. Deeds, president, National Cash Register Company, Dayton, O.; Arthur Brisbane, American, New York City; Norman Hapgood, Collier's Weekly; G. A. Leroy, La Salle, Ill.; S. A. Leland, Cadillac Motor Car Company, Detroit; Henry Ford, Ford Motor Company, Detroit; H. C. Durant, Detroit, and Benjamin Briscoe, president, United States Motor Company, New York City.

It will be noted that the speakers selected are all well qualified to discuss topics pertaining to salesmanship, publicity and kindred matters, and the session is expected to be productive of benefit to these important factors of the automobile industry.

ADVERTISING ABBOTT-DETROIT.

Company Occupies Unique Position with Woman as Manager of This Department.

The Abbott Motor Company, Detroit, maker of the Abbott-Detroit line, claims the distinction of having the only woman advertising manager in the industry. An accompanying illustration presents Miss Dorothy Kanes, who has been in charge of this department for some time. That she has made a success in her field is evident, despite her claim to be the only woman following automobile advertising as a profession.

It may be added that Miss Dorothy Kanes really is no longer entitled to that name, although she continues to use it in her professional capacity. She was married recently, and in addition to her work for the Abbott company she finds time to direct the household problems in an apartment in town, a country home and the usual servants.

MICHIGAN ESTABLISHES BRANCH.

Entire Business on Pacific Coast and in the Orient to Be Directed by It.

The distribution of the Michigan cars, made by the Michigan Motor Car Company, Kalamazoo, Mich., which is the new name of the Michigan Buggy Company in charge of manufacturing automobiles, in California, Nevada, Hawaii and the Orient, will be directed by the California branch, which was organized recently with capital of $1,000,000. The following are the officers: President, V. L. Palmer; first vice president, F. B. Lay, Jr.; second vice president, W. H. Cameron; third vice president, George H. Daugherty; treasurer and general manager, C. P. Kiel; secretary, C. C. Bobb; directors, the above and H. L. Kiel, son of C. P. Kiel.

The Michigan Motor Car Company, California branch, will occupy a handsome, modern metropolitan office building, probably in San Francisco, although the exact location has not been determined. This will include display rooms, service station and all the equipment necessary to look after the interests of Michigan users in the territory named. It is stated that the organization of the company will in no way interfere with the agencies already established, excepting that it will have direct supervision over these and all future agencies.

Miss Dorothy Kanes, Advertising Manager, Abbott Motor Company.

INCORPORATE HARRIS OIL COMPANY.

Associates of the Founder of the Concern Organize for Conduct of the Business.

The A. W. Harris Oil Company, Providence, R. I., has been incorporated to succeed the company of that name formerly conducted by A. W. Harris, recently deceased. The company is incorporated under the laws of Rhode Island and the capital stock is $75,000. The officers are: President, Benjamin S. Terry; treasurer, Arthur D. Greene; secretary, George F. Heywood. The officers named were associated with Mr. Harris for years and they propose to continue the business to the same policy that has been followed for over a quarter of a century.

NEW FORD BUILDINGS.

Factories to Be Erected at Denver, Col., and Memphis, Tenn.

The Ford Motor Company, Detroit, has purchased five acres of land at Kentucky avenue and Broadway, Denver, Col., and will erect a four-story plant, 75 by 200 feet, and will give employment to 200 men. Contracts have also been let for the assembling factory of the company at Memphis, Tenn., and building is to commence at once. The site is a triangular lot and the entire plant when completed will cost about $200,000.

LAMP CONCERN EXPANDS.

Guide Motor Lamp Company to Erect New Plant at Cleveland, O.

Because of a rapidly increasing business the Guide Motor Lamp Company, with a plant in East Fourth street, Cleveland, O., will erect a new factory building on Madison avenue, N. W., that city. When the structure is completed it will occupy the entire block on Madison avenue between West 114th and West 115th streets. Construction will be commenced at once.

TAKES NEW QUARTERS.

United States Tire Company Moves General Offices in New York City.

The United States Tire Company has moved its general offices to the United States Rubber Company's building, Broadway and 58th street, New York City. The structure is the tallest north of 42d street, and will be utilized in the future as the home of the United States Rubber Company and its subsidiaries. The building is 20 stories high. The basement and sub-basement will be occupied by the United States Tire Company as a stock room, and the 15th, 16th and 17th floors will be utilized as general offices.

MOTZ TIRE BRANCH.

New Headquarters to Be Established in Pennsylvania Coal Mining District.

Because of the large increase in the use of Motz double tread cushion tires, made by the Motz Tire & Rubber Company, Akron, O., in Pittsburg, Penn., and vicinity, it has been deemed necessary to establish a factory branch at 300 North Craig street, in that city. In keeping with the policy of the company this action carries with it the operation of a thoroughly equipped service station, with a full corps of workmen and tire experts. S. H. Frensdorf is in charge as manager. He was associated for some time with the Diamond Rubber Company's branch in Boston, before joining the Motz interests.

WILL DISTRIBUTE FIAT CARS.

Motor Car Sales Company Incorporated to Take Over Retail Selling End.

The Fiat Motor Car Sales Company has been incorporated to succeed the Fiat Automobile Company of New York City, distributor of Fiat cars, that the managers of the latter company may devote their energies exclusively to development of the Fiat factory at Poughkeepsie, N. Y. J. S. Josephs and Benjamin Eichberg, who have for years been engaged in the sale of Fiat automobiles in New York, retire from the selling organization and will devote their entire time to production at the factory.

The officers of the new company are: President, E. R. Hollander; vice president, Henry M. Sage; treasurer, Charles L. A. Whitney; secretary, R. D. Willard. The new company will control the New York, Albany, Boston and Providence, R. I., and New England territory.

STOCKHOLDERS REORGANIZE.

Dahl Punctureless Tire Company Increases Capital Stock to Assume Patent Rights.

The stockholders of the Dahl Punctureless Tire Company at the annual meeting at Minneapolis, Minn., recently reorganized the company. The capital stock was increased to $6,000,000. The new company will take over the patent rights of the Dahl Punctureless Tire Company of Minnesota, and in addition will manufacture a line of accessories. The home office will be at 246 West 59th street, New York City, with Chicago as the distributing point for the middle west.

FISK COMPANY IN PITTSBURG.

Well Known Rubber Manufacturer to Increase Facilities in This Field.

The new branch building in Pittsburg, Penn., for the Fisk Rubber Company of Chicopee Falls, Mass., is one of the most finely appointed and up-to-date quarters of its kind in the Pennsylvania city. It is located in the heart of the automobile district and is in a new building two stories high, 95 by 20 feet. The ground floor will be devoted entirely to display and salesrooms, while the second floor will be occupied by the repair department, in charge of competent factory men.

ADD TO FIRESTONE PLANT.

Pioneer Tire & Rubber Company to Make Two Additions to Factory at Akron, O.

Firestone Tire & Rubber Company, Akron, O., is erecting two wings to factory buildings of the same height and construction as these structures. The north wing will be 60 by 125 feet and the east wing 60 by 200. The concern is also erecting a new employment office in Main street.

DEVICES THAT DETECT INEFFICIENCY.

Modern Conditions Require Some Means of Revealing Misuse of Both Pleasure and Commercial Cars—What Has Been Accomplished in Solving the Problem.

WITH the growing importance of the motor car as an economic factor in the business life of the world, certain problems have arisen, many of which are by no means easy of solution, unless some special means is undertaken. The so-called pleasure car is no longer regarded strictly as such. Even when it is employed a considerable portion of the time as a means for securing enjoyment, there are many hours of the day when it is utilized solely for business purposes.

As an illustration in point, let it be assumed that a business man owns a car which is at the disposal of his wife and daughters a greater part of the time. They utilize it in shopping, in making social calls, in taking daily drives in the park or into the country, etc. It is called into service in the morning to take the owner to the office, and in the afternoon to bring him home again. This is the general use to which the car is put, and a false nomenclature has bestowed upon a machine thus employed the designation of pleasure car. It will be seen, however, that the service is in every way necessary, and while it would be equally as incorrect to term it a commercial vehicle, it nevertheless occupies an important place in the daily life of that family—of the business life of the home.

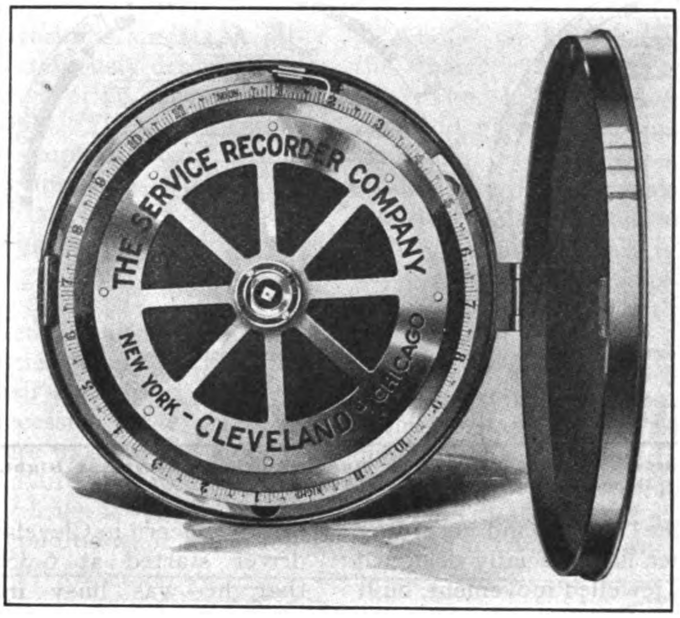


Fig. 1—ServiS Recorder in Its Metal Case, Open for Inspection.

Under such circumstances, and in numerous other instances of a like character, it devolves upon the chauffeur to assume the responsibility for the machine. It matters little whether the car is housed in a private garage or at a public service station, it is to the chauffeur that the owner must look for its proper condition at all times.

This brings up one of the problems that has confronted the public garage proprietor ever since the automobile became a practical institution. Some provision must be made for guarding against improper use of the machine, and it manifestly is unfair for the garage proprietor to be expected to accept a responsibility that should rest upon the owner or the chauffeur. In most cases some rule is adopted with reference to permitting the car to leave the garage at certain periods of the day or night without the owner's knowledge. It may be that a written order is required, or the car will be delivered to the chauffeur upon a telephone message. In any event it is fully understood that the owner must at all times assume the risk of false representation on the part of the chauffeur or others.

In the matter of the motor truck, or the car that is utilized solely for commercial purposes, there are other problems that enter into the consideration. That the mechanical transport is a factor for economy is generally admitted, but it has been indicated by careful study of the situation that the greatest economy is realized only when the maximum efficiency is secured. Certain leaks must be eliminated, but it first becomes necessary to learn where the leaks exist. And here, the chauffeur, or operator, is often called upon to assume responsibilities that do not, in all justice, belong to him, but elsewhere.

It is impossible in a discussion of this nature to point to all the circumstances which make it desirable that the owner of either a pleasure or commercial car shall be in a position to know at all times just how his machine is being employed. Any automobile means an investment of some moment. It is unwise to depend upon chance when it is possible to obtain accurate knowledge. Any owner will be able to supplement examples recalled herein by others which indicate in like manner the desirability of securing absolutely dependable information of this character.

There are a number of instruments in the market which were designed primarily for the purpose of supplying this need. They are applicable to all types of vehicles, whether motor driven or horse drawn, but it will be agreed that the peculiar demands of the motor car situation were responsible for their appearance. It is not the object of this discussion to suggest the advantage of one type over another, but merely to present the demand which they aim to fill and the claims made by the manufacturer of each. It is assumed that the owner, chauffeur, garage proprietor or business man will be interested in these descriptions and be able to decide for himself where they will be applicable to his needs.

"The man in the box" is the name which has been applied to the ServiS recorder, made by the Service Recorder Company, 2344 East 105th street, Cleveland, O. The designation is signally appropriate, since the device is enclosed in a neat little brass case, which may be located at any convenient place on the car—on the dashboard, under the driver's seat, or as is the case with many department store vehicles, fastened on the wooden frame of the top above the driver's seat. It is claimed by the maker that so long as it is installed parallel with the axle it will register.

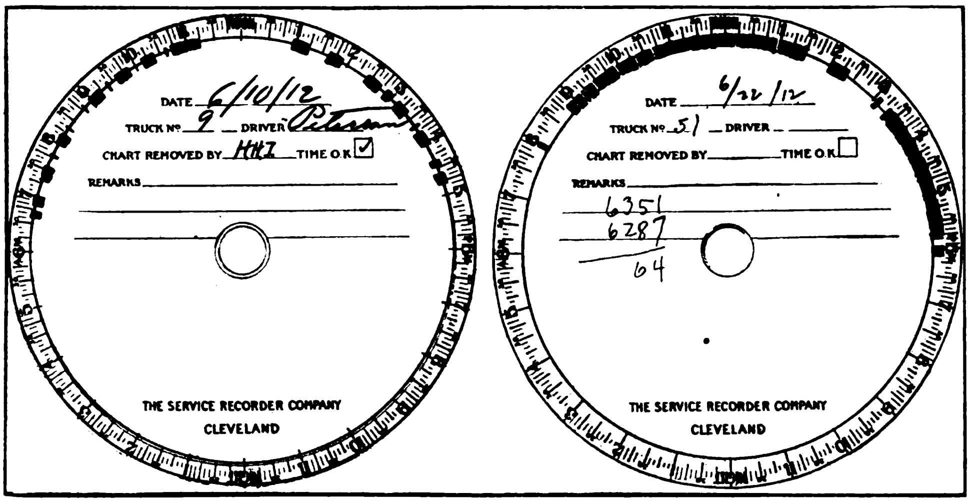
The principle is one which may not have become noticeable even to many observant persons; that no motor car, horse wagon, locomotive, or other vehicle can be moved in a forward or backward direction without perceptible oscillation. Even the lightest running automobile cannot be moved across the garage floor without the recorder registering the motion. It is claimed, however, that jarring vibrations and the like are not recorded as travel.

The instrument is patented and has two main mechanical features, the timing and recording mechanisms. The former is a specially designed Seth Thomas eight-day, jewelled movement, built and calibrated to withstand vibration, and securely protected in a sealed housing. It revolves a brass disc once every 24 hours, past a jewel pointed stylus, which registers travel and stop periods on a printed chart of sensitized paper which lies flat on the disc and revolves with it. The stylus, being attached to one end of a free swinging pendulum, marks a thin, clear line on the chart so long as the vehicle is quiet and the pendulum at rest. But when the car is in motion the pendulum is agitated to and fro and the stylus records on the chart a broad "travel" line about .25 inch wide. It is said to be absolutely impossible to fake these lines.

The chart is printed to resemble a 24-hour clock dial, the smallest graduation representing a five-minute period. The travel and stop lines are registered faithfully on the margin of the chart, indicating the exact length of every stop and the duration of every travel period, as well as the exact time at which each occurred, so that the owner has at any time a detailed, legible, accurate record of the car's movements—a complete check on his vehicle. The value of this is, of course, obvious at once.

In the case of the pleasure car, the owner always is informed as to when his machine left the garage, how long it was used, how far and how fast it was driven, what time was utilized in waiting; in fact, a complete record of its movement throughout the day or night. The garage proprietor has nothing to worry him concerning the vehicle thus equipped. The reliable chauffeur has nothing to fear, while the unsatisfactory man is detected at once.

With the commercial car, the owner or the delivery superintendent can tell at a glance whether his cars are working to their full capacity, and is enabled to determine just what is holding up the equipment. Not only does the device remove the temptation to use the car improperly or to loaf and then make up time on the road, but the chart brings to light the capable man whose ability perhaps was not fully realized before.


DATE 6/10/12
TRUCK No. 9 DRIVER Peterson
CHART REMOVED BY HHI TIME O.K ☑
REMARKS
THE SERVICE RECORDER COMPANY
CLEVELAND

DATE 6/22/12
TRUCK No. 51 DRIVER
CHART REMOVED BY TIME O.K ☐
REMARKS
6351
6287
64
THE SERVICE RECORDER COMPANY
CLEVELAND

Fig. 2—Typical ServiS Charts: At Left, Utilized by Manufacturing Concern; at Right, by Department Store Delivery System.

Accompanying illustrations present the device and set forth its method of operation in a measure. It so happens that the two charts at Fig. 2 were taken from cars utilized solely for business purposes, but they indicate the completeness of the record obtained. That at the left depicts one day's work with a manufacturing concern in Cleveland, O. It shows that the driver started at 6:35 in the morning, and that he was busy making deliveries, some of them close together and others far apart, some stops being of short duration and others longer, until 11:30, at which time. it is presumed he went to lunch. The car resumed operations at 1 in the afternoon and continued its delivery work until 4:50, when it was through for the night.

The chart shown at the right of Fig. 2 represents one day's work with a department store in the same city. Here the driver was at the garage just before 8 in the morning and took the car around to the store, where it was standing until 8:50, getting its load. It was busy making deliveries, with very few long waits, until 1:30 in the afternoon, when it returned to the store and made another short run before lunch at 2:20. After lunch it was driven to the store, loaded a third load and was busy until 5:50. After returning to the store at this hour, there was nothing more to do that day, and it was driven to the garage.

Another Cleveland product of the same nature is the Travelog, made by W. H. Brown, 706 Rose building. While it may be stated that the principle upon which it works is similar, it differs materially from that previously described, in that it permits the recording of an entire week's work, instead of one day only. The object sought is the same; namely, a complete record of the day's work, showing starting time, time of all runs and stops, quitting time, overtime, and all other details which will enable the owner or superintendent to detect leaks and suggest a remedy.

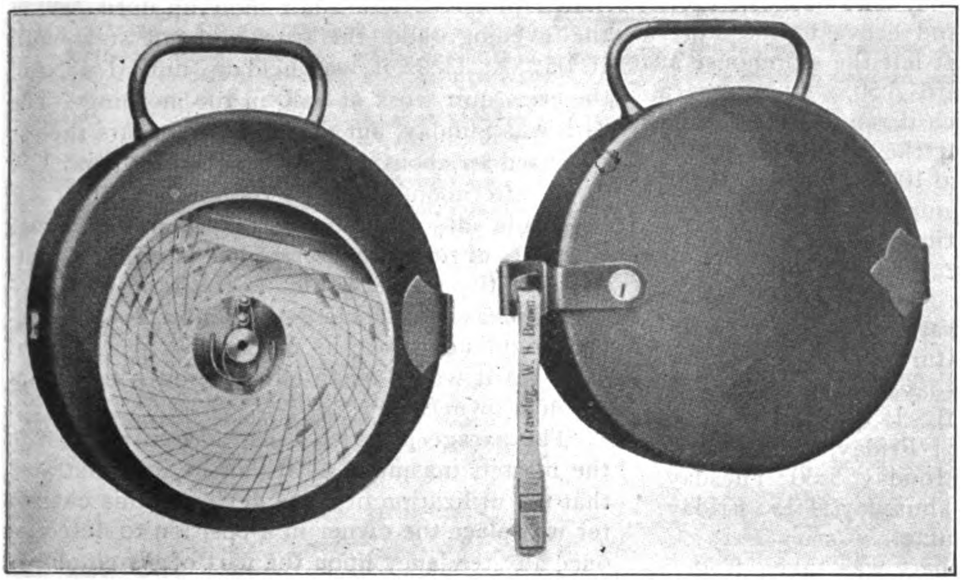


Fig. 3—Front and Rear Views of the Brown Travelog Instrument, Locked and Ready for Installation.

The maker cites the fact that although a large majority of men are conscientiously working for the better interests of their employers, the time clock has been found a necessity. These usually are installed indoors, where most of the work is done under the eyes of the directing foreman. If some method of detecting leaks is recognized as important under such conditions, it must follow that similar arguments will apply outside, where drivers are placed in charge of expensive installations that are utilized under conditions which limit the watchful supervision.

This does not necessarily imply that the driver is lax in his duties, as already has been pointed out. The object of the Travelog is to show where the delays occur, and it transpires more often than otherwise that these are due quite as much to the routing system adopted, as to the inefficiency of the operator. The Travelog possesses a number of special advantages, as well as those already mentioned.

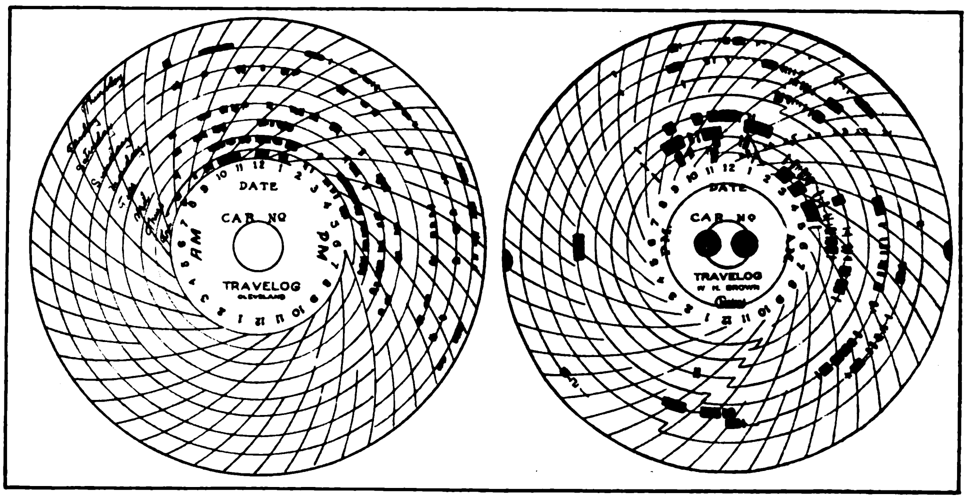


Fig. 4—Specimen Travelog Charts: At Left, Truck Hauling Machinery; at Right, Special Car on Night Work.

The maker claims the device is so sensitive that it records even when the car is touched, the principle employed being that it is actuated by the vibration of the car. The mechanism comprises an eight-day, 11-jewel standard Howard clock movement, with actuating parts of cold rolled steel, enclosed in a pressed steel case and secured with a Yale lock. It may be located on any part of the car, a bracket attachment being furnished with the case.

Two of the Travelog charts are shown herewith, and it will be noted that provision is made for automatically making a whole week's record without removing the chart. The clock also is wound weekly. The instrument is installed with an open or glass front, possessing the added advantage of affording the operator opportunity to see his record in the making, as well as to read the time of day. The case is about 7.5 inches in diameter, and the chart is a six-inch disc of prepared paper divided into 24-hour periods indicated by radial lines with hour numerals at the centre, half-hours being indicated by half-lines and shorter intervals being measured by sight. The marker traces a fine circular line while the vehicle is standing, and a broad brand while running. Each succeeding day the marker drops toward the centre to delineate a new circle.

The Travelog chart at the left of Fig. 4 was made on a truck hauling machinery. In order to explain fully the runs and stops for the first two days, as an example, it may be stated that the first day, Thursday, the chart was put on at 11:30 in the morning. The truck was moving from 12:40 until 1; 1:25 to 1:35; 1:50 to 2:05; 2:15 to 2:20; 2:30 to 3; 3:30 to 3:55; 4:15 to 4:25, and quit for the day. Friday, the crew left the garage at 6:25 and drove to the storehouse, arriving at 6:35. It left the storehouse at 7:10 and was moving until 7:50. There was a wait until 9:15, after which it ran until 9:40, and ran as follows throughout the remainder of the day: 9:45 to 9:50; 10:15 to 10:25; 10:35 to 10:55, with short stops intervening; 11:15 to 11:50; 1 to 1:05; 1:10 for a short time; 1:45 to 1:50; 2 to 2:10; 2:40 to 2:50; 3:50 to 3:55 and 4:15 to 4:20, when it quit for the day. It also will be noted that the truck began operations each day as follows: Friday, 6:25; Saturday, 6:45; Sunday, rest; Monday, 6:45; Tuesday, 7; Wednesday, 7; Thursday, 7; Friday, 7:20. It quit each day as follows: Thursday, 4:25; Friday, 4:20; Saturday, 4:25; Sunday, rest; Monday, 5:30; Tuesday, 5:30; Wednesday, 5:40; Thursday, 4:15; Friday, taken off at 9 in the morning.

The other Travelog chart was taken from a special car on night work. It shows that the crew boarded the truck at 5:50 in the afternoon of the 21st and started work at 7, going off at 11:30 the next morning. The second day the crew took charge at 6 and the vehicle was in service from 7 in the evening until 5:45 in the morning, with a long hold-up between 11:45 to 3. The 23rd the crew did not show up until 7:40 in the evening, and the truck did not start until 10:05. At 11:25 it was held up until 1:45, and the crew quit work at 6:40 in the morning. The 24th was Sunday, but Saturday it appears the car was used for about an hour between 2:30 and 3:30 in the afternoon, evidently on another job.

While all of these charts present examples with cars of the commercial type, it will be admitted that the result would be the same with so-called pleasure vehicles. Undoubtedly the record might not prove as interesting in a general way, but it would mean quite as much to the individual owner.

The garage proprietor also has an interest in the matter, inasmuch as it can be demonstrated that the utilization of some device of this character will place the owner in a position to detect at once any tendency upon the part of his employee to overstep the bounds of proper service, and put him upon his guard against further lapses. This is a phase of the situation which will be taken up in more detail in a subsequent installment.

TRADE INFORMATION EXCHANGE

BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding.

MANUFACTURERS' OPPORTUNITIES.

1001—Indiana Manufacturer, producing more than 5000 trucks annually, desires full information concerning combined electric starting and lighting system.

1012—New England Manufacturer would like to get in touch with producers of all parts for light commercial vehicles.

1015—Well Known Boston Jobber, who will leave on an extended foreign trip in January, visiting England, France, Germany and other countries, with a view to buying and placing supplies, desires to correspond with manufacturers who are interested in such foreign trade.

1025—Chicago Manufacturer wants to get into correspondence with producers of automobile accessories for use on its pleasure cars.

1027—Tire Filler Concern, well located in respect to shipping facilities, etc., desires agents in all sections of the country.

1033—Massachusetts Manufacturer of two-ton commercial vehicles, desires information concerning the purchase of channel iron for chassis and other parts.

1034—Arizona Truck Manufacturer seeks information concerning steel or wood block tires for such vehicles.

CAR AGENCIES DESIRED.

2101—New Jersey Concern desires agency for pleasure automobiles selling from $500 to $1000, and commercial cars from $1000 to $1500.

2102—Ohio Concern, just incorporated, desires agency for commercial vehicles selling from $1200 to $4500.

2103—Pennsylvania Garage, well established, will consider the agency for pleasure cars selling from $985 to $6000.

2104—Newly Incorporated Concern in New York would like agency of pleasure cars listing from $500 to $2000.

2105—New York Garage seeks agency for pleasure vehicles listing from $1000 to $2000.

2106—Missouri Company, already representing one line, desires agency for pleasure cars selling from $1700 to $2850.

1062—Kentucky Firm, recently organized, would like agency for pleasure cars selling from $500 to $5000; and commercial vehicles from $750 to $2500.

1067—Utah Concern, well established, wants agency for pleasure cars and trucks selling at about $1000.

1071—Ohio Sales Company, in large city, desires information concerning cars listing from $1000 to $3500, with a view to taking an agency.

1073—Dealer in Washington State would like agency for cars selling at medium price.

1079—Tennessee House with numerous distributing branches in the South is interested in cars selling up to $8000 and in trucks listed at $1500 to $6000.

1082—Wisconsin Dealer, well established in good location, wants agency for cars selling at $900 to $1900.

1087—Pennsylvania House, with sub-agencies in several counties, would add agency for cars selling at $1750 to $3500.

1001—Kentucky Agency, already representing one line, wants to add cars selling at about $1000.

1005—Tennessee Concern, also covering parts of Mississippi and Arkansas, would take agency for cars selling at $1150 to $1750 and trucks selling at $900 to $2200.

1007—Michigan Dealer, well established, desires agency for pleasure cars selling at $800 to $1200.

1009—New Jersey Company, recently opened, wants agency for pleasure cars selling at $800 to $1700 and trucks from $600 to $1200.

2001—Boston Dealer seeks information concerning pleasure cars or trucks fitted as camp wagons.

2003—Vermont Agency, with well established repair business, wants agency for cars selling at about $2000.

2004—Louisiana Supply Company, representing two lines, desires information concerning pleasure cars selling at $1000 to $2500.

2003—Idaho Dealer seeks agency for pleasure cars selling at or below $1600.

2009—Massachusetts Dealer, well acquainted with managers and superintendents of electric lighting companies throughout New England, desires agency for electric and gasoline commercial vehicles, capable of climbing hilly streets at fair speed, and going over good roads at from 15 to 20 miles an hour.

EQUIPMENT NEEDED.

1131—Maine Concern, erecting a modern garage, desires to get in touch with companies manufacturing thoroughly modern garage equipment, including supplies, etc.

1132—New York Garage, which recently changed hands, desires equipment for garage and repair shop.

1133—New York Concern, well established, desires equipment for garage.

1134—Pennsylvania Company, in the heart of the touring district, desires information relative to a complete equipment.

1135—New Jersey Company, recently organized, desires complete garage equipment.

1136—New Jersey Garage, recently incorporated, desires machinery and equipment for repair shop.

1137—Ohio Garage, well established, desires complete equipment for repair shop, including machinery, tools, supplies, etc.

1138—Pennsylvania Concern, recently incorporated, is in the market for repair shop equipment.

1139—New York Garage, recently established, desires full machine equipment for repair shop and garage.

1140—New York Company, well located, wants information concerning equipment for repair shop and garage.

1141—Maine Concern, recently established, desires complete equipment for garage and repair shop.

907—New Jersey Concern, recently established, desires equipment for garage and repair shop.

908—Seattle Tire Dealer, is interested in repair shop supplies and equipment for such work.

909—Milwaukee Company, just incorporated, is in need of garage and repair shop equipment and supplies, including machine tools, etc.

911—Iowa Concern, now building cement garage, wants equipment for garage and repair shop, including machine tools, etc.

915—Service Station in Salt Lake City is in the market for all kinds of garage and machine tool equipment.

923—Garage in New Jersey, recently opened, wants equipment and machine tools.•

927—Concern in Kentucky, engaged in rebuilding automobiles, desires garage and repair shop equipment.

933—Chicago Manufacturer, recently incorporated, is in the market for machine tools, etc.

936—Tennessee Company, with well established garage, is desirous of adding to its garage equipment.

939—Taxicab Company in Ohio is interested in securing garage and machine tool equipment.

941—Pennsylvania Concern, now erecting building, wants garage and repair shop equipment.

947—New York Dealer in large up-state city desires garage, repair shop and machine tool equipment.

949—Baltimore House is in the market for gasoline storage systems, pumps, vulcanizer, vehicle washers, welding equipment, lathes and other miscellaneous equipment.

951—Michigan Garage, well located for tourist trade, seeks information concerning garage and repair shop equipment of all kinds.

953—Vermont Garage, in heart of touring country, would install needed garage equipment.

955—Connecticut Concern, well established, wants information concerning garage and repair shop equipment of all kinds.

957—California Company, recently incorporated, is in the market for garage equipment and supplies.

960—Ohio Concern, well fitted to take care of all sorts of repair work, is interested in repair shop equipment.

961—Michigan Garage, recently opened, seeks information concerning garage and repair shop equipment.

ACCESSORY AGENCIES.

1200—New Jersey Garage, in well established location, desires agency for automobile accessories and supplies.

1201—Ohio Concern, in leading city, wants agency for pleasure and commercial vehicle supplies and accessories.

1202—Pennsylvania Dealer, well located, would add a full line of accessories and supplies.

1202—New York Concern, recently incorporated, desires complete stock of automobile supplies; also pleasure and commercial accessories. Would also like agency.

1204—New York Garage, newly established, wants agency for full line of accessories and supplies.

1205—Maine Garage, recently established, desires complete line of supplies, also agency for accessories for both pleasure and commercial vehicles.

970—Wisconsin Company, recently incorporated, seeks the agency for pleasure car accessories and supplies.

975—Dealer in Washington State, with well established garage and salesrooms, desires agency for pleasure and commercial car accessories and supplies.

978—Iowa Distributor, well located, wants agency for pleasure and commercial car accessories and supplies.

979—New York Garage, in growing city, would like agency for all kinds of accessories and supplies for all types of vehicles.

982—Michigan House, engaged in general repair business, wants agency for automobile accessories and supplies for garages.

986—Kentucky Dealer, well located, wants agency for pleasure and commercial car accessories and supplies.

992—New Jersey Garage, recently established, wants agency for pleasure car and garage accessories and supplies.

993—Tennessee Tire Concern, in large city, would add full line of automobile accessories and supplies.

999—San Francisco Jobber, well established, desires agency for all kinds of accessories, as sales representative for the entire Pacific Coast, including British Columbia.

1007—Idaho Company, just starting in business, seeks agencies for well known automobile and garage supplies and accessories.

1010—Louisiana Agency for pleasure and commercial cars would add full line of accessories and supplies for these vehicles.

1014—Connecticut Garage, recently opened, has splendid opportunity to develop good trade in representative line of automobile and power wagon accessories and supplies.

1016—Vermont Dealer, on line of summer tourist travel, seeks agency for pleasure car accessories and supplies.

1019—Michigan Concern, erecting new modern garage, wants agency for standard automobile supplies and accessories.

1022—Maryland Dealer, in excellent location, wants agency for tires, oils and similar goods.

1023—Baltimore Garage, now erecting new building, is interested in agency proposition for automobile accessories and garage supplies, and later will be in the market for repair shop equipment.

1028—Massachusetts Concern, well located in large city, is interested in securing the agency for automobile accessories of all kinds.

1029—Boston Dealer is interested in securing information concerning accessories and parts pertaining to the automobile industry.

1030—California Garage, in well established location, desires agency for automobile accessories and supplies.

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CARRYING STOCKS OF PARTS.

One of the greatest problems with which agents for motor vehicles have to deal is that of supplying parts necessary for restoration from damage or wear. As a rule ample stocks are carried at the factories, but many agents do not care, or are financially unable, to keep on hand what is necessary to meet every demand, especially as the number of models is considerable. This being so, in the event of need the customer must wait until an order can be sent to the factory, filled and returned, and if there is delay in receipt the manufacturer is always considered at fault. With pleasure cars an interruption of use is keenly felt, but when business is handicapped, or additional expense incurred, the owner is not inclined to be philosophical and he condemns a policy that will not afford him practically immediate service. With a factory in a single location and every requirement primarily supplied from this point, it would seem good business judgment to establish in different sections of the country, in combination with other manufacturers if the expense should be a large influence, stations where parts could be kept and delivered as ordered within such radius as could be satisfactorily served. Garages giving public service cannot be expected to invest their capital for the service of the public without reasonable recompense, and it would appear that cooperation by the makers of cars and vehicles could very much improve conditions.

DELIVERY OF MACHINES.

The demand for service vehicles has been so much in excess of the supply available for the past year that thousands of orders have been lost by dealers who could have made sales with reasonable delivery assured to the customers. This condition has been brought about by the peculiar development of many of the companies, and that agencies had been established and agents were busy while the factory organization was not sufficient to produce anything like the number wanted. Instances are frequent where agents have been unable to get machines for months, and with good prospects and no possibility of obtaining vehicles, the distributors have in self preservation been compelled to take on one or more lines, thus diverting their endeavors and lessening the business possibilities. The agents cannot be censured, when with their money invested and unable to do business they take another agency and become competitors of the manufacturers whose representatives they are, through dividing their time and developing the activities of rivals in the industry. It is decidedly better to limit agencies to the number that can be supplied with cars or wagons, because promotive work is always lost unless deliveries can be promptly made.

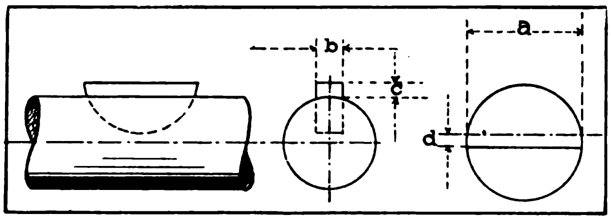
THE STOCK THAT IS DEMANDED.

When a business man learns that he is expected to have stocks of lines that are well known—a fact very quickly impressed upon him—he will also have abundant knowledge that the products best advertised are most called for. It is logical for him to provide that for which a market already exists and to reject what is not equally saleable, for with one known to the people and the other not, it is evident that it requires much more time and salesmanship to sell the latter than the former. The products that are widely advertised and have quality that is understood may be regarded as standard, and when so established in public opinion have a definite value from a business point of view that is well worth considering. Not only this, but known stock is saleable and it does not deteriorate and there is no loss from capital invested.

MECHANICAL POINTERS *for* GARAGEMEN AND OWNERS

WOODRUFF KEY SIZES.

Each year sees the use of more and more Woodruff keys for fastening gears and similar parts to round shafts, for which reason the various sizes are of considerable interest. A table herewith gives the various sizes which are referred to in the sketch above, the letters in the table corresponding with those in the figure. There are 30 standard and many special sizes, the latter of which will be taken up at a later date.



No. of key	Diameter	Thickness	Depth in gear	Less than ½ diam.
	a	b	c	d
1	.500	.0625	.0312	.0468
2	.500	.0937	.0468	.0468
3	.500	.1250	.0625	.0937
4	.625	.0937	.0468	.0625
5	.625	.1250	.0625	.0625
6	.625	.1562	.0781	.0625
7	.750	.1250	.0625	.0625
8	.750	.1562	.0781	.0625
9	.750	.1875	.0937	.0625
10	.875	.1562	.0781	.0625
11	.875	.1875	.0937	.0625
12	.875	.2187	.1094	.0625
A	.875	.2500	.1250	.0625
13	1.000	.1875	.0937	.0625
14	1.000	.2187	.1094	.0625
15	1.000	.2500	.1250	.0625
B	1.000	.3125	.1562	.0625
16	1.125	.1875	.0937	.0781
17	1.125	.2187	.1094	.0781
18	1.125	.2500	.1250	.0781
C	1.125	.3125	.1562	.0781
19	1.250	.1875	.0937	.0781
20	1.250	.2187	.1094	.0781
21	1.250	.2500	.1250	.0781
D	1.250	.3125	.1562	.0781
E	1.250	.3750	.1875	.0781
22	1.375	.2500	.1250	.0937
23	1.375	.3125	.1562	.0937
F	1.375	.3750	.1875	.0937
24	1.500	.2500	.1250	.1094
25	1.500	.3125	.1562	.1094
G	1.500	.3750	.1875	.1094

These sizes vary from .5-inch diameter and .0625 thickness up to 1.5-inch diameter and .375-inch thickness. The general shape of the keys is that of a coin cut into halves, although to be exact the half is not complete, as the sketch shows. The key is set down into the shaft less than its full depth by almost the amount of its thickness, so that the portion projecting above the shaft and into the gear or other part is nearly square in section.

One great advantage of this form over a square ended key is the ease of placement or removal, a slight tapping on one end, causing the semi-circular form to rise out of the other end of the key seat, until it is loose enough to be picked out.

IMPACT TESTING MACHINE.

With impact testing machines it is desirable that the load should be applied directly, so that as little as possible of the energy of the falling weight is lost in the intermediate connections. An English contemporary describes a machine on the principle of a weight falling on a plate and applying an impact tensile load. The plate that receives the blow is made very stiff and is securely fastened to the specimen. Care is taken that the blow from the weight on the object is a fair one, and that there is no bending as well as tension stress on the specimen. The weight weighs 82.04 pounds and is turned accurately to fit the central rod. A small key on the weight runs in a key-way on the central rod, to insure that there is no rotational motion of the weight when falling.

Two ways are employed in measuring the energy absorbed in fracturing the specimen: First, the velocity of the falling weight is measured; second, the kinetic energy of the weight after the fracture is recorded. The latter method is not considered as satisfactory as that of measuring the change in velocity. Preliminary tests are recorded.

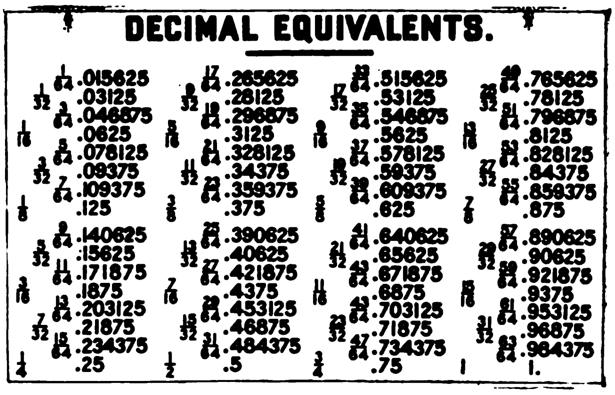
A bar of .5625-inch mild steel of commercial quality was selected. Test pieces were screwed .5 inch and turned and ground accurately to .25 inch diameter for the middle two inches.

In order to determine the effect of heat treatment on the power of the material to resist shock, the specimens were treated to different tests. In all cases the elongations due to impact testing are greater than those due to tension testing. The increase of temperature during annealing appears to reduce the total extension under the static load and impact load. In cooling the specimens in water the effect is very marked, the elongation in both static and impact tests being much reduced.

UTILITY OF DECIMAL EQUIVALENTS TABLE.

One of the great disadvantages of the measuring units used in the United States lies in the necessity for reverting to decimals for all very small measurements, as well as in every case where metric sizes are to be compared or used. This requires a frequent consultation of a decimal equivalents table. While there are many of these, too many in fact, the majority of them do not serve the purpose well for one reason or another. Some lack a logical arrangement, others are incomplete, still others rearrange the fractions in an unnatural sequence, making quick reference impossible.

For all these reasons, a good table, well and logically arranged, is very desirable. The one accompanying this is presented as embodying all these needs, besides having the great utility of being legible and of small compass. It is small enough to go on the back of a calling card yet more legible than any yet seen. It was taken from a wall hanger, being sent out by the Garvin Machine Company, New York.



DECIMAL EQUIVALENTS.

1/64	.015625	17/64	.265625	33/64	.515625	49/64	.765625
1/32	.03125	9/32	.28125	17/32	.53125	25/32	.78125
3/64	.046875	19/64	.296875	35/64	.546875	51/64	.796875
1/16	.0625	5/16	.3125	9/16	.5625	13/16	.8125
5/64	.078125	21/64	.328125	37/64	.578125	53/64	.828125
3/32	.09375	11/32	.34375	19/32	.59375	27/32	.84375
7/64	.109375	23/64	.359375	39/64	.609375	55/64	.859375
1/8	.125	3/8	.375	5/8	.625	7/8	.875
9/64	.140625	25/64	.390625	41/64	.640625	57/64	.890625
5/32	.15625	13/32	.40625	21/32	.65625	29/32	.90625
11/64	.171875	27/64	.421875	43/64	.671875	59/64	.921875
3/16	.1875	7/16	.4375	11/16	.6875	15/16	.9375
13/64	.203125	29/64	.453125	45/64	.703125	61/64	.953125
7/32	.21875	15/32	.46875	23/32	.71875	31/32	.96875
15/64	.234375	31/64	.484375	47/64	.734375	63/64	.984375
1/4	.25	1/2	.5	3/4	.75	1	1.

DRILL PROTECTOR AND HOLDER.

In drilling holes .125 and .0625 inch in diameter in hard metal with a hand or breast drill it is often difficult to prevent breakage. Considerable pressure is required to make the tool cut and sometimes this is so great that it snaps off like glass. A device that can be constructed easily is shown at Fig. 1 A, and consists of a piece of hardwood about .5 inch shorter than the projecting end of the drill when it is in the chuck. A hole is bored through the centre with the tool and is attached as shown. The wood reinforcing stiffens the drill so that it will withstand three or four times the usual pressure. Should it be necessary to drill a hole more than .5 inch deep, when the wood comes in contact with the metal it can be cut off as much more as required.

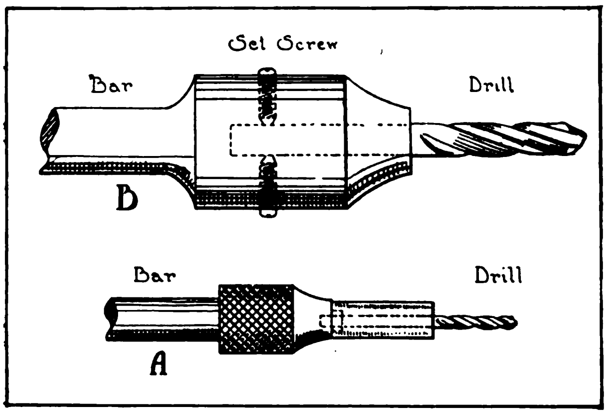


Fig. 1—Some Drill Kinks: A, Protector for Small Tools; B, Holder for Utilizing Broken Drills.

A holder for broken twist drills is shown at B. These are not very costly and form a valuable addition to the kit. Frequently expensive high speed drills are broken just at the end of the flutes through carelessness, and usually these are thrown away. A hole is bored the size of the drill and setscrews with rounded points are placed opposite each other. These enter the flutes of the tool and make a positive drive. The other end of the holder is turned so as to fit the chuck.

HOW FIRE LURKS IN WASTE.

Care should be exercised in the disposition of oily rags and waste in the shop and these should not be thrown about carelessly or allowed to accumulate as fire from spontaneous combustion is likely to follow. Many blazes from this cause are recorded as mysterious as unless discovered at their start they soon destroy all evidences of their inception.

Decomposition is a slow combustion. Oxygen uniting with carbon produces heat, and if they combine rapidly enough, in sufficient quantities, the combustion is visible in the flame. If slowly, as in the decay of inorganic bodies, the heat escapes unnoticed. Rapid chemical action will start visible combustion as easily as the application of a torch. Vegetable oil spread over easily carbonized substances such as cotton rags or waste will ignite the latter very quickly as the cotton fibre furnishes a sort of tinder.

STICKING VALVE CAPS.

When a car has been operated for a considerable period without attention to valve seats, it is sometimes difficult to remove the caps which have become rusted into place. If it be impossible to remove them with the ordinary tools or those designed for the particular make of machine, they can be started by running the motor long enough for them to become hot and pour on water or lay a piece of ice in the recess or hollow provided for the wrench. The latter should be applied immediately and given a sharp pull or tap with a mallet. This will invariably loosen the most refractory member.

Before replacing, the threads should be coated with a mixture of oil and graphite as this will not only prevent rusting but will facilitate removal when desired. If graphite be not handy, beeswax can be utilized. The threads should be heated before applying the wax.

HARDENING TAPER REAMERS.

The hardening of long taper reamers of small diameter, so as to prevent them from coming through bent or curved, is a difficult operation. The following method has been used successfully and consists of annealing the steel a second time before the finishing cut is taken, and heating slowly in a low fire by packing it in an iron tube or box with powdered charcoal, fine sand or clean ashes, then finished. The heating for hardening should be performed in the same manner as the re-annealing.

When the box and reamer have been heated thoroughly to a bright cherry red the tool should be carefully withdrawn endwise, so as to prevent the possibility of bending while hot, and immediately quenched vertically in an oil bath. Any variation from the latter position while dipping is liable to warp the work, through one side cooling faster than the other. In drawing the temper care should be taken to heat the metal evenly on all sides, so as to bring it to the same straw color, brown or light blue. Long delicate reamers always should be ground to size after the hardening and tempering operations.

REPLACING WORN VALVES.

Occasionally an owner brings a car into the shop, complaining that the engine does not run satisfactorily and misses when throttled down. This is due to wear of the valve stems or in the guides, which condition allows auxiliary air to be drawn into the cylinder and weakens the mixture. If new valves and guides can be secured it is an easy matter to remedy the trouble, but if the expense of replacing them be heavy, or if the guides be integral with the cylinders, other means must be adopted.

The valve guides should first be reamed out true, and this may be done with a fluted reamer. If they are cast in a unit with the cylinders, the member should be bolted down to the table of a drilling machine, so that the cutter can be put through the guide in position. The tool should run true.

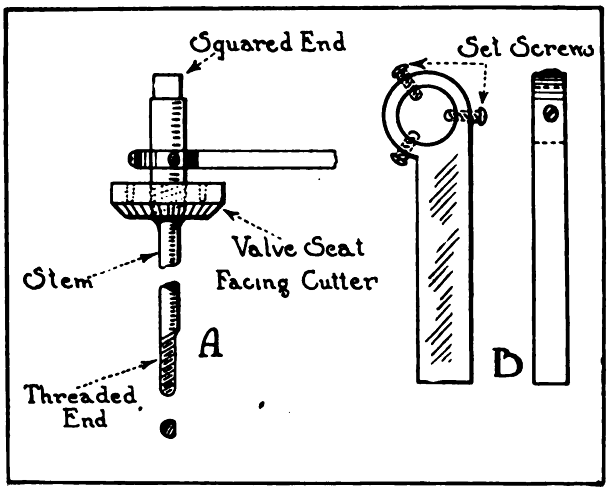


Fig. 2—Valve Cutter and Rest for Steadying Tool.

A valve cutter to recut the valve seat is shown at Fig. 2. The spindle is made of good mild steel and the cutter of the same material and case-hardened. It is not absolutely essential that the teeth be spaced equally and these may be from 19 to 23 in number. The end of the spindle is squared to take a tap wrench utilized to revolve the tool which should be made considerably larger than the valve seat.

If sufficient pressure cannot be brought to bear by hand, the lower end of the instrument can be threaded to take a nut and a flat surface should be filed on this section so that a D washer may be fitted. If the valve cap opening will not permit of the insertion of the cutter, it can be introduced from the cylinder and dropped on the valve seat. The stem is then inserted and screwed by utilizing the drilled holes in the head of the cutter.

Where new valves are required and when these are larger than can be used, they have to be turned to size. Sometimes old ones may be utilized and usually these are better than new as there is little danger of flaws. If the latter are to be used they will, as a rule, require but little turning. They should be centred quite true and if the shop equipment does not include a steadying rest, one can be made as shown in Fig. 2. A piece of .3125-inch plate is drilled to take three brass screws. The device should be held in the slide rest, and the valve chucked true by the projection on the head. The valve may then be centred with a square centre in the usual way.

When new valves are used the cotter or key holes must be made. In Fig. 3 is shown a jig for this purpose. It is made out of a piece of .75-inch square or round mild steel, on which two flats are filed parallel to one another. A hole is drilled through it from end to end to fit the valve stem. Another is also drilled and tapped to take a setscrew which is utilized to hold the stem.

A line is then marked on the jig true to the valve stem, when the base is square, and for the holes. The stem is then placed in the jig, the screw tightened, and one hole drilled on each valve. The first one is then replaced, a tight fitting cotter pin pushed through the jig and stem and the second hole drilled. This is repeated with the other valves. The third hole is made with the pin in the second hole and so on until all have been drilled.

The reason for the use of the cotter is that in marking the jig, the holes should be made just to break into one another. When drilling one at a time if the pin is in the adjoining hole the drilling is done against solid metal, and there is no danger of the tool breaking through.

LIGHTING SYSTEM NEGLECTED.

Many a motorist has been obliged to drive slowly as well as cautiously at night on a country road because of a faulty lighting system. This important member of the motor car is easily neglected and usually receives attention only when necessity demands an overhauling. The rubber tubing deteriorates and minute cracks appear, through which the acetylene gas escapes.

This also applies to that section of the tube attached to the outlet leading to the burner. Tubing should be examined and replaced as soon as its surface becomes hardened. It should also be wired to the metal piping where the latter is employed. Leaks will appear in rubber tubing especially if it is old and the gas burners clogged, as with gas tanks, a considerable pressure is developed.

The gas burners should be cleaned as the openings through which the gas passes are very small and easily stopped by particles of dust. Some owners complain that they do not get good results from gas tanks; that they vary considerably in the number of hours of light. This is usually due to leaks or the system being dirty. Aside from annoyance, leaky tubing is dangerous as the gas is easily ignited and liable to set the car on fire.

CLEANING CIRCULATING SYSTEM.

A clogged circulating system may be cleaned thoroughly by a solution of soda, followed by hydrochloric acid. The former dissolves the greases in the tubes, while the latter removes the rust and scale. In the average case a 25 per cent. solution of the commercial grade of the acid would probably do the work in from 15 to 20 minutes. The system should be washed out thoroughly after using both solutions.

LEAKY RADIATORS.

Some owners of cars complain that they cannot effectually stop radiators from leaking, although they have been removed from the car and soldered, after which, being tested with air pressure, the cooling member was apparently tight. Often vibration will create a leak especially if corrosion has begun. Leaks are sometimes caused by the device holding the radiator being sprung or the frame bent. An owner who was annoyed by a leaky radiator and who expended a large sum for repairs, effected a remedy by placing strips of rubber between the radiator and its seat, thus minimizing the vibration.

LUBRICATION TROUBLES.

With the approach of warm weather the owners of some cars are experiencing difficulty in preventing grease working from the differential out through the axle housing to brake drum from whence it is thrown about by the revolving wheel. This results in the tire becoming plastered with dirty grease, as well as the fender and the adjoining members.

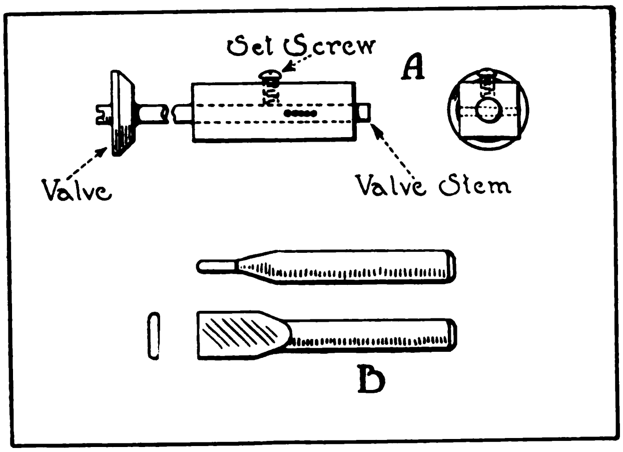


Fig. 3—Jig for Drilling Valve Stems and Drift for Clearing Holes.

Oil is decidedly injurious to rubber and the task of cleaning the casing as well as the car is not pleasant. In packing the differential a good grade of grease or non-fluid oil should be used, one that has a sufficiently high melting point to withstand frictional heat. The old lubricant should be removed and gears thoroughly cleaned before applying new. Should this fail to prevent the grease working out, felt washers may be inserted on either side of the differential.

To Harden Iron Superficially—(a) Mix two parts potash, 16 parts burned ox-hoofs, or burned leather parings and eight parts of soot-black, all finely pulverized, with ox-blood or tallow to a dough and spread the mixture thickly on the iron, heated to a dark red. The iron is then to be heated to redness and cooled in clean water. (The hoof horn and leather scraps must be heated to a brown, not black, coal, in an iron kettle and then pulverized.) (b) Thirty parts horn charcoal, five parts rasped wood, 10 parts potash niter, 60 parts common salt, 7.5 parts glue (salt previously roasted). (c) Eight parts soot, eight parts sal ammoniac, 20 parts charcoal powder, mixed to a paste with a solution of carbonate of ammonia.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Protecting Pouring Fuel from Cans.

(104)—Can you tell me if there is any way of pouring gasoline from cans fitted with screw tops on one side of the container without spilling the fluid? I buy my fuel and store it in five-gallon cans used formerly for oil. I have tried the usual method of pouring with the vent at the highest point, but am not successful. As my garage is not wired for electricity and I use gas lights, I am afraid of the fuel exploding while filling my tank at night. JOHN WILLIAMS.

Savannah, Ga., Sept. 8.

A device has been brought out by an English concern called "The Liquall Safety Petrol Filler," a sketch of which is shown at Fig. 1. The large threaded end is screwed on to the ordinary gasoline can, and as shown in part section a division is formed in the filter whereby air can enter the container as the fuel is poured out. The position of the air vent is clearly shown in the drawing. At the small end of the filler is fitted a gauze cup which strains the liquid as it passes out. It is claimed that owing to the design of the air vent, a two-gallon can may be emptied in 40 seconds. The large threaded end is "stepped," allowing it to be used on cans of differing sizes.

Relative to Horsepower.

(105)—To settle a dispute please advise me of the meaning of the letters A. L. A. M. as applied to motor horsepower rating? Also, the difference of horsepower between a straight line drive and that of a shaft at any angle? C. A. WINTER.

Wellsville, Kan., Aug. 15.

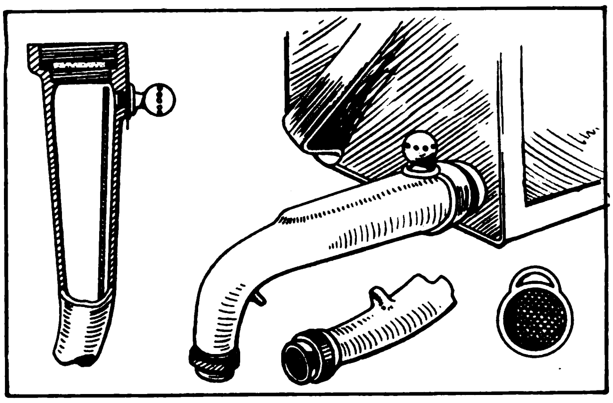


Fig. 1—Filler Device Admitting Air to Fuel Container.

The letters referred to are an abbreviation of the Association of Licensed Automobile Manufacturers which organization utilized a standard formula for approximate rating of gasoline engines used in automobiles. It is based on an assumed piston speed of 1000 feet a minute, and was originated by the Royal Automobile Club of Great Britain. The A. L. A. M. has been reorganized as the Automobile Board of Trade and the horsepower rating adopted by it has been accepted by the Society of Automobile Engineers, and will be known in the future as the S. A. E.

The efficiency of a straight line drive such as a chain is estimated at 90 per cent. while that of a shaft with gears delivers approximately 86 per cent. These figures are based upon experiments of the chief engineer of a leading motor car factory.

Flooding of Carburetor.

(106)—I have a 1910 model ——— car and my ——— carburetor always leaks when I shut the engine off, but does not do so when it is running. The float seems to be level, and the gas valve tight. At least I cannot blow through the latter when I hold the float up. RALPH SEIPP.

Hazel, S. D., Sept. 11.

Flooding is caused usually by dirt on the inlet valve seat, or poor seating of the valve and this may be brought about by some injury when cleaning or installing the device. If the float be too high the fuel will overflow and the conditions described result. The correct position or level of the gasoline should be between .03125 and .0625 inch below the tip of the spraying nozzle. When flooding is due to dirt it can be stopped sometimes by priming and allowing the fuel to flush out the foreign elements by opening the petcocks. It is possible that the inlet valve does not seat properly and grinding this may help. This is a delicate task and the use of emery should be avoided.

Carburetor Troubles.

(107)—Will you please help me in the following trouble? I have a ——— car with a ——— carburetor from which I only get half power. This is when the throttle is wide open, but I get better results with it only half open. I wrote the manufacturers of the car and they said they would give me a new ——— carburetor with ball valve. Would it be wise to put this on, as the old one gives fair results? What is the ——— with ball valve? What is the reason I cannot get more power from the old one when the throttle is wide open? G. G. WHITE.

Elkader, Mass., Aug. 21.

The trouble with the present form is that the needle has not been properly set. The gasoline needle valve should be set to the proper amount of flow for slow speed, while the auxiliary air valve should be arranged to give the right amount of air at highest speeds. Since your trouble is at the latter, it would be well to look that over first. This is done as follows:

Run the engine as fast as possible. Turn the auxiliary air valve regulating screw up and note if the speed increases or decreases. If it decreases, turn the screw down and note the result. This can be varied by large amounts, turning the screw rapidly so as to get a result quickly. If the direction of turning which brings about the highest speed is not clear, turn more slowly, first in one direction and then the other. Having found the approximate point, try for the highest possible speed close to that.

While highest speed does not always agree exactly with greatest power, it does approximately, and the setting of the valve should not be changed until one is certain that it is not right for power. A good way to do is to try out the adjustment on the level for car speed, then go to a steep hill and try it out for hill climbing ability. If you can improve the old carburetor to give the best results, it is well to stick to it and not use the new one, although the fact that the manufacturer recommends a change and offers to give you a different make may mean that others have found the same fault, and the new device is offered as a better substitute.

Carbide Impelled Engine.

(108)—I am one of your Journal readers, very much interested in gas engines and have an idea for a design of a carbide gas engine upon which I would like some advice. This engine will, I think, be cheaper to operate than gasoline. Please answer the following questions: (1)—To what pressure, in pounds, can carbide generate gas? (2)—What amount of carbide and water are necessary to give a pressure of 50 pounds a cubic foot? (3)—What is the average heat generated in the formation of gas by carbide and water, and would the gas give the same pressure hot or cold? (4)—Could this gas be used in a six-cylinder engine, working two-cycle? (5)—What is the price of carbide in 100-pound lots? Has any one ever tried to build an engine of this character? E. H. SLAVIC.

New York City, Aug. 20.

No one has ever tried to build an engine of this character, for the simple reason that it is not a practical scheme. To begin with a heat engine must produce a very large amount of heat and reject but a small portion of it. Acetylene gas, the product of calcium carbide and water, is a medium which would not furnish either, hence it would be inefficient. Moreover, it is expensive, comparatively speaking. In 100-pound cans, carbide is $4.50, or 4.5 cents a pound, while in smaller amounts it varies from twice that upwards.

The average gravity of gasoline today is from 58 to 66. At the latter figure it weighs 5.5 pounds a gallon, so that at 16 cents a gallon, the price a pound is 2.91 cents. At 60 degrees, the weight is but five pounds a gallon, so the price of 16 cents is equivalent to 3.2 cents a pound. The first figure is 35 per cent. and the last 29 per cent. cheaper than carbide even when buying the liquid in small lots and the calcium in large quantities.

The various pressures cannot be given with any degree of accuracy, but the opinion ventured is that no pressure above a few pounds could be obtained. If a pressure in excess of the weight of water in the tank plus the value of its head or height above the carbide, were generated the gas pressure would prevent the water from flowing, and thus stop the further generation of gas. Such being the case, a generator would have to be used in which the gas was drawn out as fast as it was formed, this requiring a vacuum pump. Even then, to obtain higher pressures than say 15-20 pounds would require a source of outside pressure, as a power driven compressor.

Similarly, the exact amount of water necessary for gasification of a given weight of carbide cannot be given for the reason that water varies greatly in purity as does also the calcium product. No information is available as to the heat generated, but it is considerable. Finally, it is doubted if this gas, even separately compressed, could be used with success in any form of engine, while as shown above, even were this possible and the engine developed to an efficiency equal to the best gasoline engines, the cost of power would be greater than under the present method.

Valve Timing Angles.

(109)—Please tell me through the very valuable columns of Queries how to time the valves and spark in two-cylinder and four-cylinder automobile engines. Give a diagram of the workings, as there are no marks on the balance wheels of the cars I am interested in.

W. J. HILL.

Boston, Mass., Sept. 13.

In timing an engine of any number of cylinders, it is only necessary to have a valve timing diagram for one cylinder, then all four or two as the case may be, are timed from this, taking them in the order in which the pistons rise. That is to say, the crankshaft as the maker designed and machined it will govern the firing order of the cylinders. Each one should have its valves timed according to the diagram, taking the four in this firing order sequence.

Fig. 2 shows a valve timing diagram. This is self sufficient but will be gone over in detail to emphasize the main points. Starting with the inlet valve, for it is necessary to get a charge into the cylinder before it can be compressed or fired, this may open at 15 degrees past the upper dead centre. To determine the dead centres, open the top of the cylinders, either taking out a spark plug or otherwise making an opening through to the piston. In this place a stick which will rest on the top of the piston. Turn the engine over slowly, noting where the stick comes out of the cylinder the greatest distance. After turning over several times this can be noted accurately and marked on the stick, as well as on the flywheel with a temporary mark.

It will be well at the same time, to mark the lower dead centre. This will be found in the same way, except that the point to be noted then is the lowest point of the piston, which will be the point at which the stick goes down into the cylinder the greatest distance.

Having these two points marked, the flywheel will be turned in the direction in which it runs normally for 15 degrees. On your flywheel mark this as the point of inlet valve opening. Then continue turning down to the lower dead centre and 25 degrees past it. Mark this the point of inlet valve closing. Continue turning in the same direction up to the upper centre again and from five to 10 degrees past it. This will be the firing point. For slow speeds like at starting, 10 degrees or higher should be used, while at higher speeds and normal running about five or less is used. For very high speeds as in racing the firing point goes back past the upper centre.

Turning once more in the same direction go down to within 35 degrees of the lower centre and mark this point exhaust valve opening. Continue past the lower centre and around up past the upper centre five degrees. Mark this exhaust valve closes. Between this and the point of beginning there will be an interval of 10 degrees, the flywheel at this point having made two complete revolutions.

Now having all of your points marked on the flywheel, take off the valve caps, so as to observe the valve action. You will also require a very thin sheet of paper, like a cigarette paper folded once. Place this latter between the top of the inlet valve lifter and the lower end of the inlet valve of the cylinder you are going to start on, and turn your flywheel as before.

Turn first to the point marked inlet valve opening. Up to within a very little bit of the exact point of opening, it will be possible to pull the paper out of the clearance space, but at the opening point, it will be held firmly. Going around to the next point, that of inlet valve closing, the paper will be held firmly, until the exact point of closing is reached when it will be free and you can pull it out. Do not depend entirely upon the paper, but observe the valve motion through the valve cap opening, using if necessary a stick as with the piston to observe its rise and fall. If the valve does not open and close at the points indicated, the cam must be shifted or the adjustment changed so as to get this action. This statement is, however, subject to the modification that if the opening be adjusted to agree with the flywheel marks, the closing may differ slightly, as the maker may have designed his cams for a slightly different diagram.

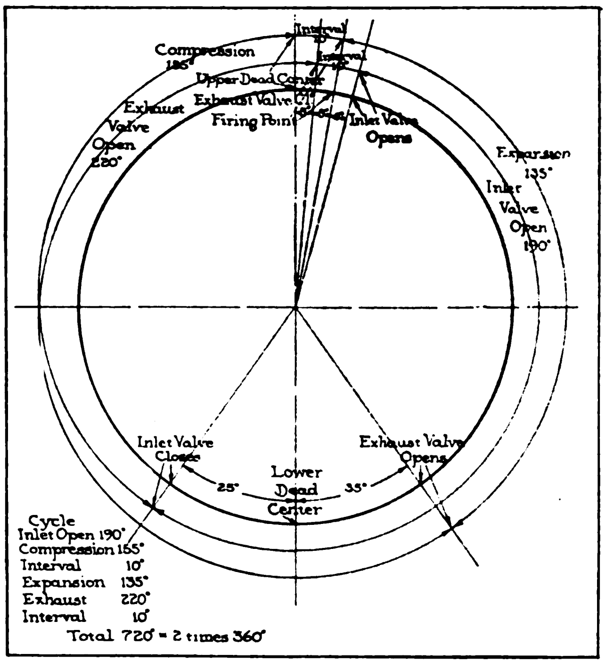


Fig. 2—Chart Outlining Standard Methods of Valve Timing for Two and Four-Cylinder Engines.

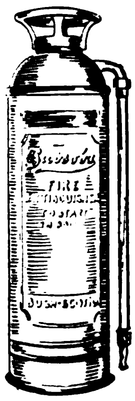
Transfer your paper and sticks to the exhaust valve of the same cylinder, and continue turning the flywheel. At the mark exhaust valve opening, just above the lower dead centre, note if the valve does actually open. If it does not, change adjustment or cam, or both, so as to make it. Then try for the point of exhaust closing just past the upper centre.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Buscoba Fire Extinguisher is made by the Bush-Scott Company, 31 Woodward avenue, Detroit, and is of the liquid variety. It is of the conventional type, in which it is only necessary to turn it bottom up with a jerk to start the extinguishing fluid. It is tested to 350 pounds pressure, and is strongly constructed so that neither bottom nor top can be blown off, or the hose torn off. The metal is heavy Lake Superior cold rolled copper. The capacity of the extinguisher is three gallons, which is ample to take care of a good sized blade. The liquid liberates carbon dioxide gas, which smothers the fire effectually.

Buscoba Extinguisher



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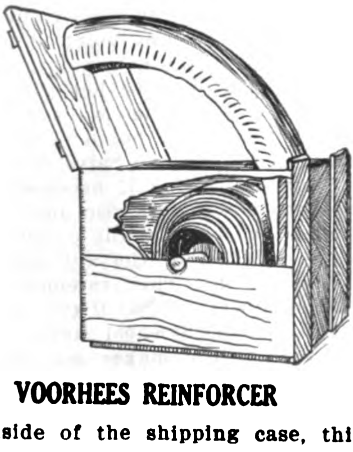
Voorhees Ideal Reinforcer is manufactured for the convenience of tire repairers and comes in reels of 50 and 150-foot lengths, mounted on a spindle which fits inside of the shipping case, this arrangement making for accessibility as well as keeping the material clean. It is utilized for the reinforcement and protection of tires, and is produced by the Voorhees Rubber Manufacturing Company, which concern maintains offices at Jersey City, N. J., New York City and Boston.



VOORHEES REINFORCER

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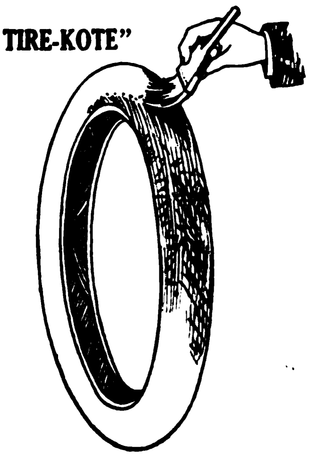
Tire-Kote is a liquid preparation made by the Page-Lester Company, Chicago, for preventing the deterioration of tires when not in use, as well as when in service. The fluid is applied with a brush after the surface has been cleaned thoroughly and it is said that it will dry in about 10 minutes. By its use cracks, crevices and cuts are filled and the preservative prevents action of oils, water, sun or other deteriorating influences. A feature emphasized of Tire-Kote is that shabby and travel-stained shoes are made to look like new as it imparts a white color. It is stated by the maker that the composition is not affected by mud and is thoroughly water and weather proof.

"TIRE-KOTE"



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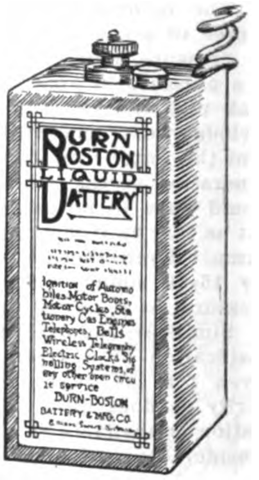
The Burn-Boston Liquid Battery, made by the Burn-Boston Battery & Manufacturing Works, Boston, is produced in two forms, water and moisture proof, the latter type being known as the No-loss. They are similar to the usual square dry cell and require the same number in a set, but it is claimed that they will give considerably longer service and will not deteriorate when out of service. This is due to the composition of the electrolyte which is liquid, non-freezing and non-sulphating, and will not evaporate. The zinc connection of each cell is a flexible wire, permanently attached. Each carbon terminal is equipped with a lock washer, preventing a connection from working loose by vibration. The voltage of each member is 1.5 and amperage about 20.

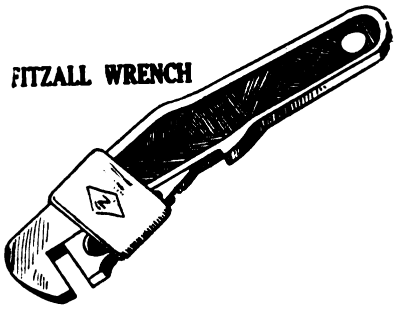

BURN
BOSTON
LIQUID
BATTERY
Ignition of Automobiles, Motor Boats, Motor Cycles, Stationary Gas Engines, Telephones, Bells, Wireless Telegraphy, Electric Clocks, Signalling Systems, or any other open circuit service
BURN-BOSTON
BATTERY & MFG. CO.

BURN LIQUID BATTERY

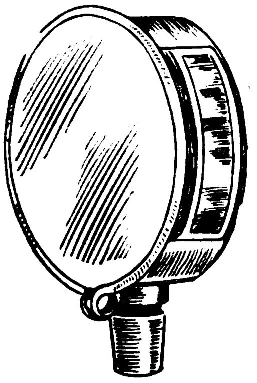
★

Fitzall Wrenches, so named because of their fitting and adjustable qualities, present a new application of a well known mechanical principle, that of the inclined plane or wedge. They consist of a shank having a fixed jaw, a wedge shaped slideable jaw or tooth block, and a movable locking band. The latter two members slide easily and are locked positively when pressure is applied. In addition to being instantaneous in action they are free from knurled nuts, screws, etc., and permit of openings of varying dimensions very quickly. The only wearing part is said to be the tooth block which is removable and may be renewed at a very slight expense. They are manufactured by the Standard Wrench & Tool Company, Providence, R. I.

FITZALL WRENCH



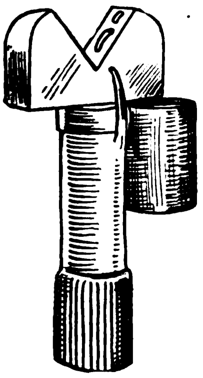
Edmunds & Jones Tail Light, produced by the Edmunds & Jones Manufacturing Company, Detroit, is operated by electricity and has in addition to the usual red semaphore a white lens by means of which the license plate is illuminated. The lamp is constructed of a high grade material, compact and very neat in appearance. By removing a set screw the member may be dismantled for inspection or adjustments. It is dust, moisture and weather proof.


EDMUNDS & JONES

* * *

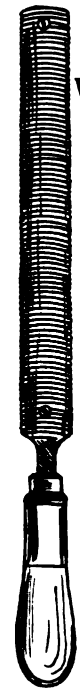
Young's Self-Lighter is a practical device which will appeal to motorists whose cars are equipped with acetylene. By it the lamps may be lighted or extinguished without the driver leaving the seat, the operation involving but a turn of a valve and a throw of a switch lever. A feature of the equipment is its simplicity. Anyone may attach the entire outfit in a few minutes and once installed it does not require any attention whatsoever. The burners consist of the usual members but carry a wire which is utilized for jumping a spark across the gap, which ignites the acetylene. The construction of the burners is such that the heat does not affect the lighting device or its operation. The system includes a special switch, a gas valve and the burners. The switch is fastened to the dash and a wire leads from it to one of the burners and a second lead to the secondary terminal of the regular coil. The gas regulating device is also mounted upon the dash and is operated easily. When the use of the lights is desired the valve is turned and the switch lever moved, thus closing a circuit and causing a series of sparks to jump across the gap in the wires at the burner. Another position of the lever extinguishes the lamps and shuts off the gas. The self-lighter is not expensive and does not interfere with the use of the lights in the ordinary manner. It is manufactured by A. G. Young, Pittsburg, Penn. William H. Pollack, 607 Webster avenue of the same city, is selling agent.

YOUNG'S SELF LIGHTER



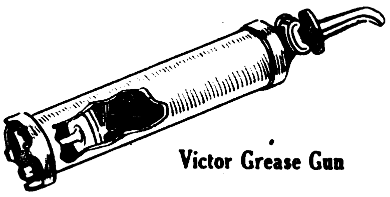
* * *

The Vixen File, for which the maker claims non-clogging and superior abrasive qualities, is the product of the Vixen Tool Company, Philadelphia. It was invented by Alexis Vernaz of Switzerland and has deep semi-circular teeth on either side, the design of which produces, it is stated, a keen cutting edge as well as a shearing cut. The tools are made of a very high grade crucible steel and the teeth are cut one at a time with an end mill shaped like a hollow cylinder, and the edge beveled off to an angle of 60 degrees. This method of forming the teeth leaves the steel untouched as regards its constituent parts. The Vixen file will permit of resharpening from four to six times. It is made in different styles and sizes.


VIXEN FILE

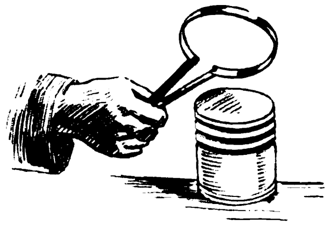
* * *

The Victor Grease Gun, marketed by the Judd & Leland Manufacturing Company, Clifton Springs, N. Y., will appeal to motorists as the device holds two pounds of lubricant which is not injected into the differential or other part by the usual method, but by the utilization of a tire pump. The spout end of the gun is removable, and having a three-inch aperture is filled easily. The pump is then attached and a few strokes produces sufficient compressed air to force the lubricant out of the gun when the stop cock, with which the instrument is fitted, is turned to an open point. The gun is equipped with a reducer adaptable to the spout for service when lubricating universal joints, etc.

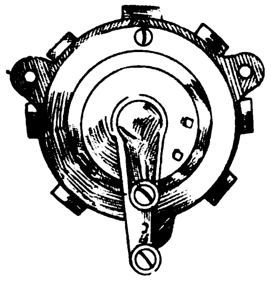

Victor Grease Gun

* * *

The Sword Piston Ring Remover, made by the Sword Manufacturing Company, Inc., New London, Conn., is designed to make easy the removal and replacement of piston rings, it being claimed that these members may be handled without danger of breaking. It will appeal to the owner who repairs his own car as the rings may be held securely when replacing a cylinder without danger of pinching the fingers. The device resembles a pair of pliers and its ends are so constructed that they will fit any type of ring. In practise the ends of the tool are fitted to the ring and when the jaws are expanded the ring may be removed easily. The replacement of the member is also a simple matter.


Sword Piston Ring Holder

The Crary Self-Starter, made by the T. C. F. Manufacturing Company, Detroit, differs from those of ordinary form, inasmuch as the acetylene may be admitted to both

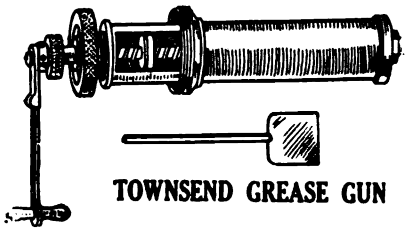


Crary Self-Starter

the cylinders and the intake manifold. The flow of the gas and the proportions thereof are controlled by a special distributor and the needle valve member is included in the dash device. The latter is equipped with two levers, these serving to operate the needle valve and distributor. The smaller member is removable, locking the device. It is pointed out that the gas may be shut off from the dash as well as the amount regulated to secure a proper mixture.

★

The Townsend Grease Gun differs from the usual device utilized for the handling of hard lubricants as it may be completely filled, is clean to handle, and is operated easily and quickly. It comprises two seamless brass tubes, telescoped together. The outer member is equipped with a threaded cap which is movably mounted upon a rod or plunger. The outer end of the larger barrel is threaded for the purpose of attaching a cap when the grease gun is being operated and to allow the inner barrel to be moved out when lubricant is being inserted. The inner tube is open at the forward end and closed at the rear. A screw .375 inch in diameter and eight inches long is journalled in



TOWNSEND GREASE GUN

the rear end of the inner tube, and is fitted with a jointed handle. Attached to the screw member is a piston with a lip which fills the opening and also stops the lubricant from crawling backward. This lip prevents the piston from turning, but when the handle is rotated the screw revolves and the piston travels along the tube, pushing the grease before it. The inner tube has a section cut away and this is filled with lubricant by means of a steel paddle. When the compartment is filled, the inner tube is moved inward and the cap screwed on. The device is 2.5 inches in diameter, eight long and holds about one pound of lubricant. The nozzle member is slightly curved and its opening is approximately .1875 inch in diameter. It is said that the gun may be filled and emptied in about 40 seconds and that it may be loaded without soiling the hands. Owing to the liberal sized opening in the inner tube and the fact that this member is loaded separately, air pockets are avoided and the gun may be completely filled. It is made by S. P. Townsend & Co., Orange, N. J.

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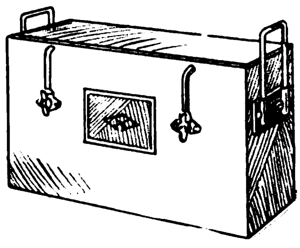
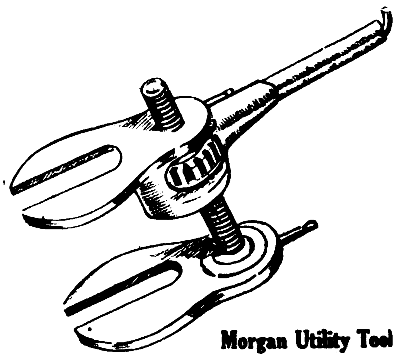
The Philadelphia Storage Battery is a new product of the Philadelphia Storage Battery Company,



Philadelphia Storage Battery

Ontario and C streets, Philadelphia, Penn., and was designed especially for motor car service and for utilization both for ignition and lighting. A feature of the battery is the use of thin plates, an arrangement decreasing the weight of the cells, and it is claimed by the maker that the amperage capacity is augmented. They are made in three types, the ampere-hour capacity being 54, 72 and 90, respectively, and the voltage six, which is standard. These batteries are very compact for a given capacity, the smallest member being approximately eight inches high, six wide and eight long. The largest battery is of the same dimensions except length which is 13 inches. They are fitted with neat handles, facilitating the replacement and removal of the member and the terminals are easy of access and are said to be non-corrosive.

The Morgan Utility Tool is manufactured by B. Morgan, Newport, R. I., who has placed upon the market a number of practical accessories. It is a useful device



Morgan Utility Tool

inasmuch as it may be utilized for a number of purposes in the repair shop and garage, or upon the automobile. It comprises two slotted jaws, one of which is securely fastened to a threaded bolt while the other member is actuated by a ratchet. This arrangement permits of contracting or compressing the jaws when removing or replacing valve springs or stretching these members. Another use to which the tool may be put is that of holding patches on an inner tube, and it may also be attached to the running board and employed as a vise.

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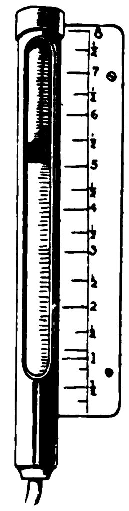
Rudell's Gasoline Register is made by the California Novelty Art Company, 618 South Olive street, Los Angeles, Cal., and, as its name indicates, registers the amount of gasoline in the tank. It is not dependent for its operation upon floats, springs or compres-



Rudell Gasoline Register

sion parts which may wear and get out of order. It is simple in construction and may be attached in less than 20 minutes and its advantages are obvious.

MAGNETOS FOR GAS ENGINE SERVICE.*

Principles Involved in the Design of Standard Instruments, Features of Construction and Conditions Essential to Efficient and Continued Operation of This Generally Adopted Source of Electric Energy.

(Continued from August Issue.)

Sometimes the grounding wire leading from the magneto to the switch may become short circuited with the frame at certain points before it reaches that member, and of course this will cause irregular ignition or put the magneto out of commission altogether. With a battery and coil system a shorted ground wire makes no difference with the engine operation.

If the spark produced is regular but weak, the magnets may have lost a portion of their strength and must be remagnetized. A rough test to determine if the magnets are sufficiently strong is to remove two pairs of them from the pole pieces and see if either couple will support the weight of the other. Care should be taken to always replace the magnets so the like poles will all be on the same side of the base. If the magnets will not sustain their own weight, they should be remagnetized preferably by the manufacturer, or other capable electrician.

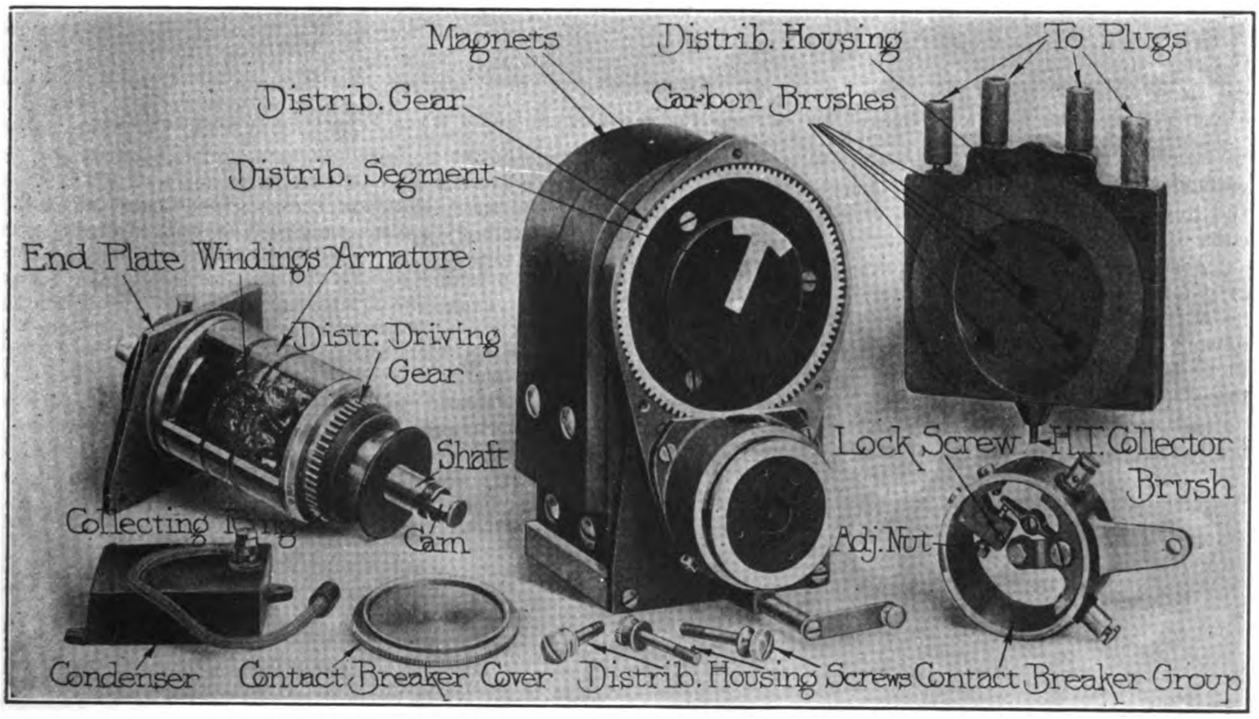


Fig. 54—Volta High-Tension Magneto Dismembered to Show Construction of Important Parts.

Cleanliness Important.

If the magneto be unclean, wash it out with gasoline, and let it dry thoroughly before starting the car. If the secondary current sparks between the disrupter points it means that there is a broken or detached plug wire. There have been cases, in the writer's experience, where a magneto had not been properly installed; of the driving gear on the armature shaft, which was simply forced on a taper, slipping, which, of course, changed the proper timing. It is advisable to securely fasten these driving gears to the armature shaft by means of suitable keys or taper pins after proper timing has been ascertained. Never take a magneto armature or condenser apart, as there is no need, there being little liability of internal derangement. If such is suspected, have repairs made by the manufacturer or by an electrical expert familiar with magneto design and construction.

Adjusting Contact Points.

In adjusting the platinum points at the contact breaker several conditions should be noted, first that these are firm in the screw and lever, and that the surfaces are not burnt, pitted or otherwise roughened. Beads of metal on one surface will cause a closed circuit even when the points are separated, as will deposits of carbonized oil or metallic or carboniferous particles. The sole precaution to be observed, after the surfaces are trued (if they need this) is that the points are adjusted so that the gap when the circuit is fully broken will conform to the gauge furnished by the makers, which is approximately .015625-inch, sometimes less. The lock nut is loosened, the screw moved up or down as the case may be, and the lock nut again tightened.

Timing Low-Tension Magneto Igniter Plates.

On cars fitted with low-tension make and break plates it is sometimes necessary to retime the engine in order to obtain the best balanced operation. There are several points where deterioration will soon cause lost motion, and as the points wear down they should be retimed that the ignition of all cylinders will remain synchronized.

All low-tension systems, whether or not current comes from a magneto, are arranged to separately adjust the ignition time in the cylinders by varying the point of make and break on the igniter plate, and

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*This article, which is descriptive of a number of the best known magnetos to be found in the market, and which are standard with motorists, is reproduced from the "A B C of Magneto Ignition Systems," one of the series of Standard Handbooks of Automobile Mechanics published by The Automobile Journal Publishing Company.

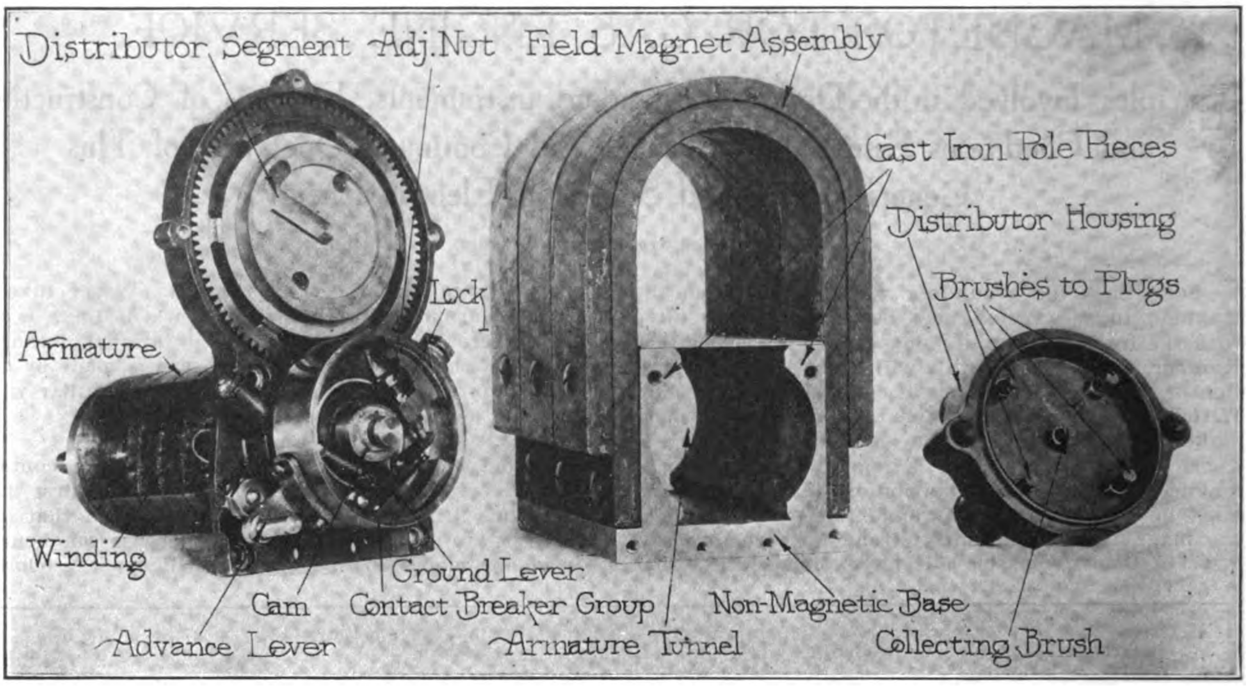

Distributor
Segment
Adj. Nut
Field Magnet Assembly
Cast Iron Pole Pieces
Distributor Housing
Brushes to Plugs
Lock
Armature
Winding
Ground Lever
Cam
Contact Breaker Group
Non-Magnetic Base
Advance Lever
Armature Tunnel
Collecting Brush

Fig. 55—The Various Elements Which Form the Splitdorf Magneto When Properly Grouped Together.

in event of trouble it is well to see that this timing coincides with the point of armature position where the lines of magnetic force are deflected through the coils of the armature.

Assuming that the adjustment of some particular cylinder is in proper condition, the crankshaft should be turned in the direction of its working rotation, never backward, until the piston in the cylinder known to be in proper time is nearly at the end of its compression stroke. Then the spark lever should be advanced carefully until the points on the igniter are just about to break contact, and the spark lever should be left in this condition until all cylinders are tested.

The crankshaft is then turned forward half a revolution at a time and each piston brought up to within one-quarter to three-eighths inch of the end of its compression stroke and the necessary adjustment made to cause the igniter to just about break contact. This may be timed with great exactness by the use of an electric bell and a few cells of dry battery. The wiring circuit is as shown in Fig. 16 and the exact point of breakage can be detected because the bell will stop ringing, starting again as soon as contact is made. In order to prevent con-

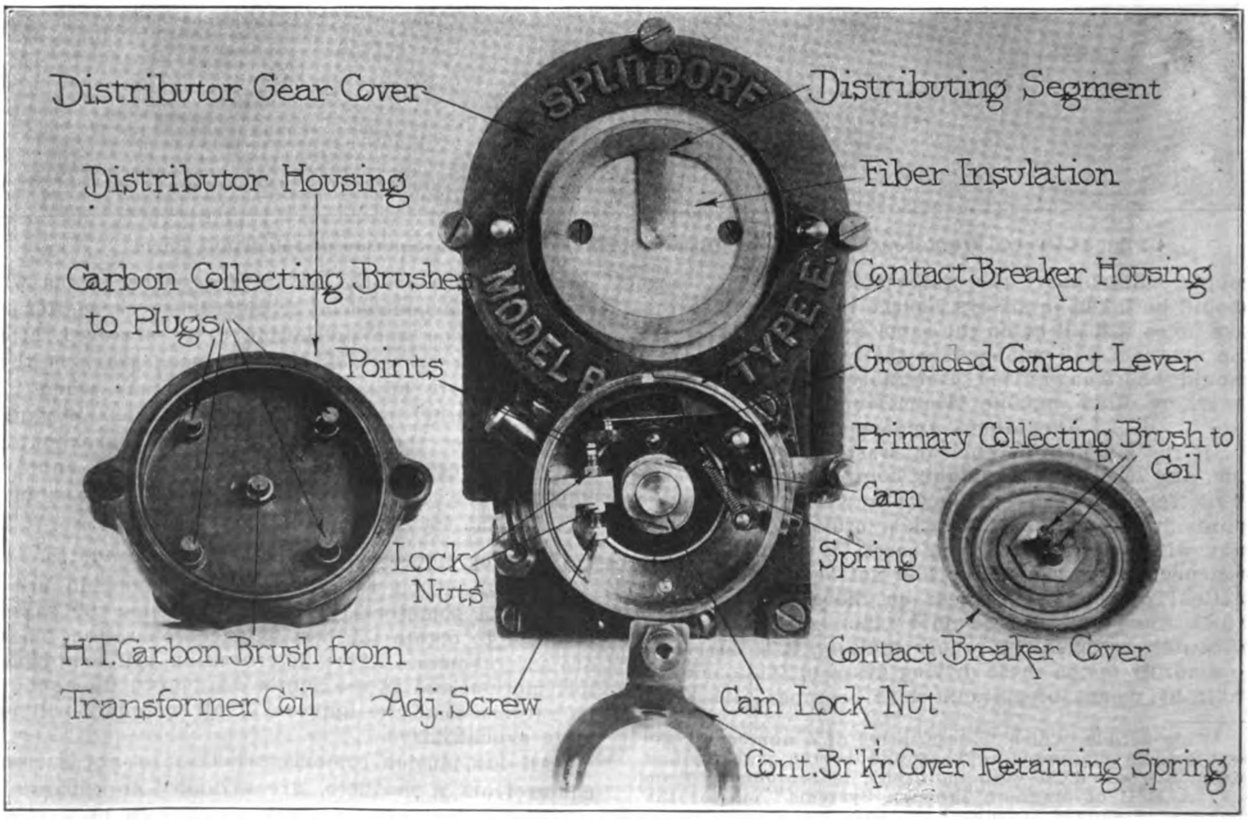

Distributor Gear Cover
SPLITDORF
Distributing Segment
Distributor Housing
Fiber Insulation
Carbon Collecting Brushes to Plugs
MODEL B
TYPE E
Contact Breaker Housing
Points
Grounded Contact Lever
Primary Collecting Brush to Coil
Cam
Lock Nuts
Spring
H.T. Carbon Brush from Transformer Coil
Contact Breaker Cover
Adj. Screw
Cam Lock Nut
Cont. Br'k'r Cover Retaining Spring

Fig. 56—Contact Breaker and Distributor Parts of Splitdorf Magneto.

stant ringing of the bell, it is well to have a small switch in the circuit, or to have one wire attached to either the bell or the battery in such a manner that contact may be broken until one wishes to test the time of breaking contact at the igniter plate.

The reason for not turning the crankshaft backward is that this will cause any lost motion in the gears and connections to show itself in the spark timing. The magneto should never be removed or its gears taken out of mesh without first assuring one's self that they are marked, so that they can be replaced as before. If they are not so marked, they should be before they are unmeshed.

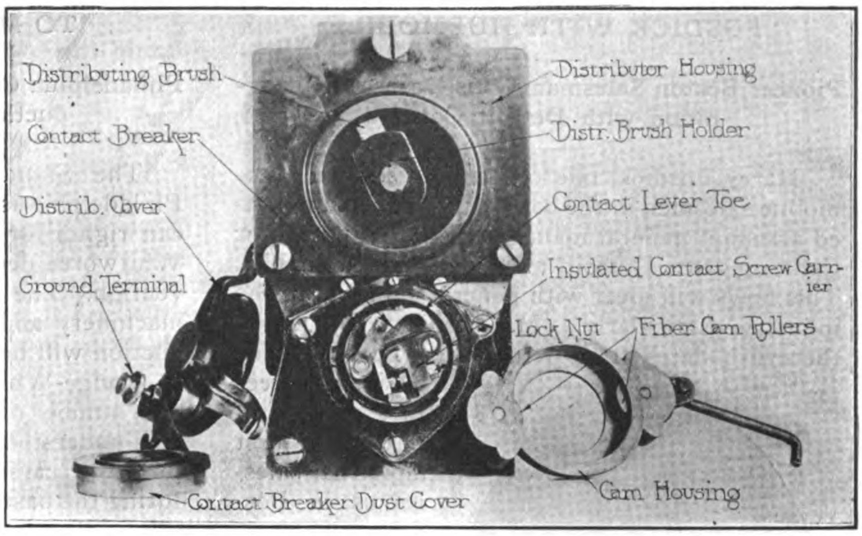


Fig. 57—Showing Distinctive Contact Breaker Employed on Bosch Magneto.

Armature Position Important.

The relation which should exist between the position of the armature and the point of break of the points at the igniter plate is very important. The correct angular engagement of the magneto armature with its driving gear is that at which the armature is practically vertical when the spark lever is advanced the limit. This position is shown in sketch at Fig. 16. By vertical is meant that the iron poles of the armature are bridging the gaps between the pole pieces of the magnets. In other words, the armature core may be likened to a letter H which is lying on its side. The exact position of the armature core should be a little backward from the vertical position rather than a little forward if the position of the gear teeth make this choice necessary. The armature of the magneto should never be removed without a piece of soft iron being placed across the poles of the fields of the magnets to prevent the latter from gradually losing their strength.

LOCATING LEAKY CYLINDER.

When water is leaking from a water jacket into one of the cylinders of a multi-cylinder internal combustion motor, it is often a difficult task to ascertain which is at fault. One method of locating the trouble is to fill the radiator to its top and turn the engine slowly, noting which cylinder is compressing. If for instance the leak is in the No. 1 cylinder, the water will flow out of the radiator when that cylinder is compressing. This will be brought about by the gas in the combustion chamber blowing through the leaky place and forcing the water out of the jacket into the radiator, thus causing an overflow. By watching each cylinder the troublesome member may be located.

ROAD REPAIR FOR GASOLINE UNION.

A motorcyclist accidentally broke the gasoline pipe where the cone end is soldered on to the pipe, and being some distance from a place where the damaged member could be resoldered, made a temporary repair in the following manner: Possessing a piece of soap and string, he moistened the latter and covered it with soap. The twine was then wrapped around the broken end of the pipe until it stood in a little ridge, in shape something like the useless cone. The end of the string was threaded under the nut which was slipped down and the end of the pipe pushed into the union of the carburetor. The nut was then screwed home and the balance of the string twisted tightly around the exterior of the joint and smeared with soap.

To Make Wood Acid Proof—Some storage batteries carried in wooden battery boxes on cars, annoy the owners by leaking or slopping of the acid. To make the wood acid proof take six pounds of wood tar and 12 pounds resin, and melt them together in an iron kettle, after which stir in eight pounds of finely powdered brick dust. The surface to be covered must be thoroughly cleaned and dried before painting with the warm preparation.

Working Steel and Iron—Steel never should be kept hot longer than necessary for the work to be done, as if left too long in the fire it will lose its steely nature and grain, assuming more of the qualities of cast iron. When steel has been subjected to heat not absolutely uniform over the whole mass care for annealing should follow. Hot steel always should be put in a perfectly dry place of even temperature while cooling. A wet floor might prove sufficient to cause serious change. It is hard to make the average worker in steel believe that very little annealing is necessary, and that a very slight change is more efficacious than a great deal.

Iron heated and suddenly cooled in water is hardened, and the breaking strain, if gradually applied, is increased, but it is more likely to snap suddenly. If heated and allowed to cool gradually it is softened and the breaking strain is reduced. If brought to a white heat iron is injured if it is not at the same time hammered and rolled.

To Make Corks Impermeable and Acid Proof—Should the gas vent cap of a cell in a storage battery become lost or broken, a cork can be utilized provided it is properly treated. Select the corks carefully. Bore a hole to allow the escape of the gas from cell. Prepare a solution of gelatin or common glue, 15 parts, in 24 parts of glycerine and 500 parts water. When preparation comes to a boiling point, immerse corks, taking care to weight them down. After boiling several hours remove and dry in the shade until free of all moisture. To render acid proof add a little ammonium dichromate to the gelatin solution.

To Clean Aluminum—Although aluminum is one of the metals most inalterable by air, nevertheless it will tarnish. It can be restored to its mat whiteness in the following manner: Immerse the articles in a boiling bath of caustic potash; next plunge them quickly into nitric acid, rinse and let dry. Gray or unsightly aluminum may be restored to its white color by washing in a mixture of 30 parts borax dissolved in 1000 parts water, with a few drops of ammonia added.

FOSDICK WITH HUPMOBILE.

Pioneer Boston Salesman Wins Deserved Recognition with Detroit Concern.

Harry Fosdick, one of the best known automobile salesmen in the country, has been appointed assistant general manager of the Hupp Motor Car Company, Detroit, maker of the Hupmobile. This news will meet with general approval in the industry, particularly as Mr. Fosdick's connection therewith dates from 1899, when he began his business career in charge of one of the first motor car salesrooms in Boston.

Harry Fosdick, Assistant General Manager, Hupp Motor Car Company.

It was under his direction that the Winton first made its appearance in New England, and later he was identified with a number of foreign importations. At one time he was vice president of the Hol-Tan Company of New York, handling the American sales of the Fiat, and afterwards he was associated with Vincenzo Lancia in introducing the Lancia car in this country. He went to the Hupp concern from the Stevens-Duryea Company, where he was sales manager for some time.

JONES SPEEDOMETER EXPANDS.

Manufacturing Facilities Almost Trebled by Additional Factory in Brooklyn.

In order to meet the greatly increased demand for its product, the Jones speedometer, recorder and other like devices, and to fill large speedometer contracts with various car manufacturers for the 1913 season, the Jones Speedometer Company, New Rochelle, N. Y., has secured additional factory facilities in the Bush Terminal, Brooklyn, N. Y. This new plant is much larger than the one in New Rochelle, and it is estimated that the production facilities will be trebled by the move.

Although it is not the intention of the company to abandon its present plant, the general offices and shipping department will be removed to the new location, Oct. 1. On that date the commercial vehicle department, now at Canal place, New York City, where recorders, hub odometers and truck speedometers are manufactured, will be moved to and consolidated with the speedometer service station in the Speedometer building,

TO MAKE WIRE WHEELS.

Philadelphia Concern Will Engage in Their Production Under British Patents.

The Standard Roller Bearing Company of Philadelphia is said to have acquired the American rights for the manufacture of the Rudge-Whitworth detachable wire wheels, a British invention. The concern is installing the necessary machinery and it is anticipated that active production will begin within the near future.

Rudge-Whitworth wheels are utilized abroad on a number of well known pleasure vehicles, and it is understood that several American manufacturers of cars have become interested in them during the past few months. It is stated that blue prints showing specifications and requirements for particular models have been filed with the Standard Roller Bearing Company for sufficient wheels to warrant production in quantities.

BAKER ELECTRIC POLICY.

Follows Example of Many Gasoline Car Producers in Abandoning Yearly Model.

While a number of makers of gasoline pleasure vehicles have announced their intention of abandoning the yearly model within the past two years, the Baker Motor Vehicle Company, Cleveland, O., is believed to be the first producer of electrics to adopt this policy. Concerning this step, O. B. Henderson, sales manager of the concern, says:

"Continuity of development is our watchword. Instead of once a year giving the purchaser the benefit of added refinements, we have found it more satisfactory to all concerned to continuously incorporate in the manufacture of the Baker electric all the improvements created up to date, so that each car we produce is the best possible car we can make, embodying everything of merit which we can put into it."

WITH INTERNATIONAL MOTOR.

Vice President Lloyd of General Vehicle Company Enters the Gasoline Field.

R. M. Lloyd, who has been connected with the General Vehicle Company, Long Island City, N. Y., maker of G. V. electric trucks, as vice president for several years, has resigned to become assistant to President Coleman of the International Motor Company, New York City, maker of Mack, Saurer and Hewitt gasoline commercial vehicles.

Following the announcement of his retirement many of his old associates were entertained by him at a dinner at his home in Oyster Bay, N. Y., at the conclusion of which he was presented with a handsome silver smoking set. The full significance of the move has not been made public, although it has been suggested for some time that the International Motor Company was anxious to enter the electric field.

NEW FACTORY BUILDINGS.

Demand for New Departure Ball Bearings Makes Necessary Additional Facilities.

Because of the largely increased orders for New Departure ball bearings, the New Departure Manufacturing Company, Bristol, Conn., finds it necessary to work all of its departments 127 hours a week and some of them 152 hours. It is stated by the company that this condition is assured for months to come, but the situation is to be relieved in a measure by the erection of additional factory buildings.

These additions will give nearly 75,000 square feet of floor space, but this will not be available until late in the fall. Three outside machine building plants, and the company's own extensive manufacturing machine shop are busy on special machine equipment for the new buildings.

DeWitt Page, secretary of the company, states that during the past year numerous leading automobile manufacturers gave the product of this concern a very exhaustive test, and as a result contracts were signed which will triple the output of the last 12 months. Naturally, the company is very much gratified, and Mr. Page is of the opinion that the entire industry should be more than ordinarily interested in the supremacy of this American product in the home market.

NEW TRUCK CONCERN.

Well Known Men Interested in Standard Company Now Being Organized in Detroit.

The list of commercial vehicle manufacturers in Detroit is to be increased by the addition of the Standard Motor Truck Company, which has been incorporated for $50,000. Among those who are active in the new concern are Howard Wilcox, for some time past connected with the Kelsey Wheel Company, and W. K. Ackerman, formerly assistant manager and purchasing agent for the Reliance Motor Truck Company, located in Owosso, Mich.

A factory at 975 Bellevue avenue, 35 by 140 feet in dimensions, has been secured, and the work of producing trucks will be begun in the near future. The vehicle is to have a capacity of three tons, and will be of standard construction throughout. The motor will be a Continental.

RESPONSIBLE FOR CARTERCAR.

Success of Well Known Friction Driven Line Now Devolves Upon H. R. Radford.

At a recent meeting of the board of directors for the General Motors Company, Harry R. Radford was elected vice president and general manager of the Cartercar Company, Pontiac, Mich., maker of the well known friction driven Cartercar line. In the future he will have complete charge of the factories of this concern, bringing the engineering, purchasing, manufacturing, advertising and selling organizations, with all of the branches in New York City, Philadelphia, Detroit, Chicago, Kansas City, Omaha and San Francisco directly under his personal direction, and making him solely responsible for their success.

That he is eminently well qualified for this position is evidenced by the remarkable ability displayed while he held the position of sales manager during the past several years. Because of his record along this line he was made general sales manager about a year ago, and since that time his personality and energy have enthused the other members of that organization.

Vice President Radford announces that during the coming season the company will construct and market about 5000 Cartercars. The total production this year was in the vicinity of 3500. He points to this increase as ample justification for continuing the friction transmission, which has been a feature of this line for the past eight years.

Harry R. Radford, General Manager, Cartercar Company.

MARMON TRUCK NOW.

Indianapolis Maker of Pleasure Cars Springs Decided Surprise upon Industry.

The Nordyke & Marmon Company, Indianapolis, Ind., maker of the well known Marmon line of pleasure vehicles, has announced the production of a Marmon light delivery wagon. The information that the concern would add a commercial car to its line came as a distinct surprise to the industry, but it is stated that the question has been under advisement for some time, and that a few of these wagons were built for use about the factory some months since. The design may be regarded as thoroughly tested and not as an experiment in any sense of the word.

The Marmon truck is a light delivery car with capacity of 1200-1500 pounds. The motor is the same as employed on the 32 horsepower Marmon pleasure car, with the exception that the bore has been reduced from 4.5 inches to four. An additional mechanical feature is the automatic governor, which is held to limit the speed to a maximum of 20 miles an hour. Another new idea in truck construction is the use of dual pneumatic tires on the rear wheels.

GOES WITH GRAMM.

Another Official Follows His Old Chief into the New Business Venture.

W. H. Moore, General Sales Manager, Gramm-Bernstein Company.

W. H. Moore, for some time manager of the sales department with the Gramm Motor Truck Company, Lima, O., control of which was purchased recently by John N. Willys of the Willys-Overland Company, Toledo, O., has resigned to accept a similar position with the Gramm-Bernstein Company of Lima, although his new title will be general sales manager. Mr. Moore has grown up in the sales end of the motor truck business, and is well known as a salesman of ability.

Since the retirement of B. A. Gramm, and his association with M. Bernstein, formerly a director of the Gramm company, in the establishment of a new manufacturing enterprise along similar lines, several of the members of the old organization have joined him. Among the others is Fred Biszantz, designer and general superintendent.

Recently John N. Willys brought suit at Toledo against A. L. White and W. T. Agerter of the Gramm Motor Truck Company, asking for a cancellation of a contract involving the purchase of this concern, alleging fraud, in that the financial condition was not as represented to him.

OHIO TAKES OVER JEWEL.

Former Carriage Concern in Cincinnati Loses Its Identity in Motor Company.

The secretary of state in Ohio has authorized the merger of the Jewel Carriage Company and the Ohio Motor Car Company, both of Cincinnati, O. In the past the Jewel company, which formerly was a well known maker of horse vehicles, has been in charge of the sales of the Ohio gasoline car, made by the Ohio company. The carriage end of the business was sold to the American Carriage Company of Cincinnati some months ago.

The Ohio Motor Car Company is constructing an additional plant at Colborne, Ont., which will be operated by the Canadian branch. The officers of the concern are: President and general manager, Charles F. Pratt; vice president and factory manager, A. E. Schafer; secretary, Charles M. Anderson; treasurer, O. M. Blake; sales manager, H. F. Boulden; engineer, R. E. Northway.

NEW DISCO STARTER.

Maker of Well Known Gas Device Brings Out Combination Electric Equipment.

The success of the Ignition Starter Company, Detroit, Mich., in connection with the production of an acetylene gas starting device for automobile engines, has been such as to warrant it in increasing its capitalization to $500,000. Coincident with this announcement comes the information that an addition to the line has been perfected in the Disco electric lighting, starting and ignition equipment.

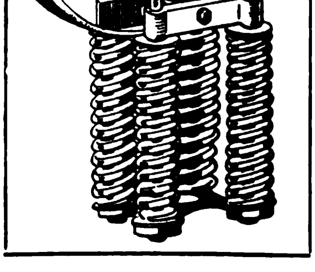
In order to manufacture this latest product the plant of the Gray Motor Company in Detroit has been taken over, giving the Ignition Starter Company 20,000 square feet of additional floor space.

VELVET AUXILIARY SPRINGS.

Ingenious Device for Absorbing Road Shocks and Vibrations.

The pleasures of motoring are enhanced when the machine rides easily over obstructions and rough roads, and it is essential to equalize the variance in loads. These qualities are secured in the Velvet auxiliary springs, which are so designed that shocks and vibrations are absorbed.

As will be noted in the accompanying illustration these comprise four sensitive adjustable coils or compression members, two of which are secured at the bottom by plates retained by cup washers and nuts. The blocks are bolted to the car spring, when attached to three-quarter elliptic members, and the weight is supported by the four coils. The other portion of the spring is equipped with similar blocks which prevent side sway. The first named set of blocks slides freely up or down upon four studs and a plate is utilize to properly space these members, preventing binding.



Velvet Auxiliary Springs.

A quality of the device is that it may be attached to any spring easily and without altering the parts or employing special fittings. Replacing as they do the stiff, solid link of the rear spring, both downward and upward movements are equalized. The Velvet auxiliary springs are fully guaranteed and moderately priced. George Sumner, Inc., 1843 Broadway, New York City, and 755 Boylston street, Boston, is distributor.

HUBER PATENT NOW.

Invention Held to Cover All Forms of Three Point Suspension of Main Frame.

Following closely upon the announcement that the Automobile Board of Trade has secured the right to licenses under the so-called Dyer transmission patents, comes information that the North American Vehicle Company, Detroit, proposes to enforce its rights under the invention of Emil Huber, which was made the subject of patent 88,407, granted to Huber, April 25, 1905. This is held to cover all forms of three point suspension of the main frame and many of the unit power plants now in use.

Briefly outlined, the company claims that the Huber patent covers "any driving mechanism of an automobile wherein the parts that go to make up the same are brought together in what is termed a unit power plant, suspended at three points upon the main frame, and wherein one of the points forming the triangle is arranged to swivel."

It is stated that already two or three manufacturing concerns have taken steps to secure licenses under this patent, based upon a fee of $1 for each $1000 of catalogue selling price, and that suits for infringement are to be brought in the near future.

ANOTHER COMPANY IN FLINT.

Concern Organized with Capital of $300,000 to Produce Six-Cylinder Machines.

The Sterling Motor Company of Flint, Mich., has been organized with capital of $300,000 to engage in the manufacture of six-cylinder cars. While no authoritative announcement has been made, it is understood that the new concern will constitute one of the units of the Republic Motor Company, which was organized recently by W. C. Durant and others.

The new plant is to be equipped with modern machinery, made especially for its requirements, and will be ready to begin operations before the close of the year. The initial output is to be taken by the Little Motor Car Company of Detroit.

PERFECTION TIRE FILLER.

New Resilient Material Designed for Replacing Air in Pneumatics.

An elastic, resilient material designed for replacing air in pneumatic tires, known as the Perfection tire filler, is being introduced by the Perfection Tire Filler Company, 619-621 Old South building, Boston, with factory in Somerville, Mass. It is the result of experimentation covering a period of years, the initial test having been made in December, 1907, and is being sold with a guarantee that it will not disintegrate, oxidize, rot or run, and that it is absolutely unaffected by extreme heat or cold.

It is expected to appeal to all motorists, and particularly to those concerns which have found difficulty in utilizing hard rubber tires on light delivery wagons, etc. The policy of the officials has been that of demonstrating under all road and weather conditions that the new filler was a success, before placing it in the market. Among the claims made for it, are that it will double tire mileage, eliminate tire troubles, hold its original form and maintain resiliency. It is stated that under tests made by the company, shoes in which the Perfection filler was employed remained in service until the fabric eventually wore through entirely.

The company is composed of men who are prominent in New England motoring circles, and the factory has been especially fitted for the manufacture of the product. The laboratory is in charge of an expert chemist, and it is maintained by the concern that it is in a position to carry on an aggressive sales campaign.

SPEEDWELL EXECUTIVE FORCE.

Several Department Heads Assume Additional Responsibilities in Management.

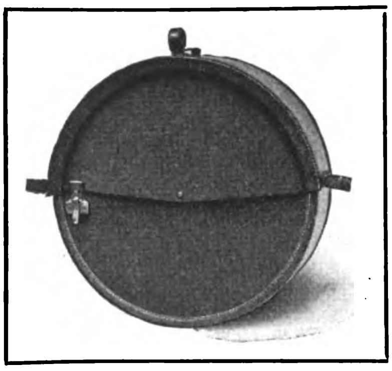
Frank A. Groves, Sales Manager, Speedwell Motor Car Company.

The Speedwell Motor Car Company, Dayton, O., maker of Speedwell pleasure and commercial lines, has reorganized its executive force, the changes bringing about promotion and entailing new duties for several of the officials. President P. D. Schenck, who has been acting in that capacity since the organization of the concern, has assumed in addition the duties and responsibilities of general manager. J. E. Schneider, who also has been with the company since its formation, has been elected secretary and treasurer.

Another promotion is that of Frank A. Groves, who becomes sales manager. This information will come as a pleasant surprise to a large number of friends, particularly in the Middle West. Like many other successful salesmen in the industry, Mr. Groves is a graduate from the sales force of the National Cash Register Company of Dayton. After 14 years with that concern he found himself financially able to assume an interest in the Chicago agency for Speedwell cars. That was nearly five years ago, and his success in that field has been sufficient to warrant his selection for his present responsibilities.

S. C. S. TIRE TRUNK.

The advantages of a tire trunk are many. It serves to protect the inner tubes from the weather or foreign elements, makes for accessibility when the tubes are needed, and being equipped with locks prevents theft of the tubes as well as other material which may be carried in the trunk. The S. C. Simon & Co., 1020 Race street, Philadelphia, is marketing the S. C. S. revolving door tire trunk which is constructed of high grade material and guaranteed in every respect. The solid basswood rim is .1875-inch thick and is covered with a high grade material, water and dust proof, and the maker points out that it is practically indestructible. The trunk is equipped with a revolving door, as will be noted by the accompanying illustration, an arrangement making for convenience.



The S. C. S. All Wood Body Tire Trunk.

NEW IDEA IN GEAR SHIFTING.

William D. Hughs of Atlanta, Ga., has invented a new gear shifting device which is of considerable interest. It does away with the usual side lever, and substitutes a controller on the steering wheel operating in conjunction with the clutch. The gears are shifted by the movement of the clutch pedal, selection of the gear being made by the controller, so to change speed it is only necessary to depress the clutch, turn the controller to the proper point, and re-engage the clutch. The first movement of the returning clutch engages the proper gear, the engagement being complete before the clutch takes hold. The device, besides rendering it unnecessary to remove the hands from the steering wheel to change gears, prevents stripping, as the gears are shifted only when the clutch is out.

PROSPEROUS YEAR AHEAD.

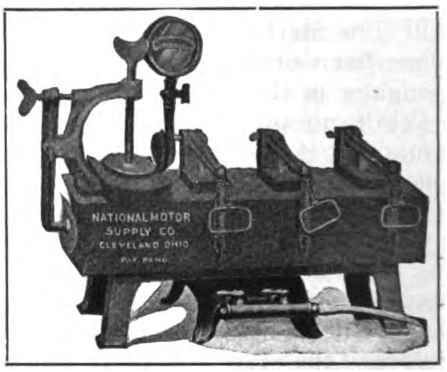
George M. Dickson of the National Motor Vehicle Company, Indianapolis, Ind., maker of National cars, returned recently from a business trip throughout the West. He is decidedly optimistic concerning the outlook for the coming year. He says:

"Of course, with motor cars, as with almost everything else, success depends largely upon the crops. I find Kansas has harvested the second largest crop of wheat in its history, a gain of 70 per cent. over last year, and that corn is expected to exceed its 1911 record by about the same figure. In Missouri corn will show more than 1,000,000 bushels increase over last year. The acreage of this crop in Illinois is larger this year than last. In Nebraska, it is expected almost to double last year's production, and approximately the same is anticipated of wheat. There is a reported increase of wheat in Iowa. Oklahoma promises 196,000,000 bushels of corn as against 37,000,000 bushels in 1911, and wheat, 21,000,000 bushels as against 9,000,000. Arkansas expects at least 13 per cent. increase in corn. In Texas, the figures on corn are 211,000,000 bushels for 1912 and 69,000,000 in 1911. In fact, taking the country as a whole, the reports indicate increases throughout."

NATIONAL GARAGE VULCANIZER.

Many proprietors of garages and repair shops realize the large profits from repairing inner tubes and shoes, but have not installed suitable equipment owing to the cost of the apparatus as well as knowledge of proper operation. Realizing that there is a demand for a simple, practical vulcanizer, adaptable for the garage, the National Motor Supply Company, Cleveland, O., has produced a tire repair outfit, which is moderately priced, and which is styled the National Garage Vulcanizer. The machine, which is depicted in an accompanying illustration, will repair three tubes and two casings at the same time and in an efficient manner.

The vulcanizer was designed by a man of extended experience with a leading tire manufacturer. The water is placed directly in the machine and heated by a gas or gasoline burner, these coming with the outfit. The vulcanizer may be connected, if desired, to a steam line. It takes less than 25 minutes to generate steam with the burner device and the cost of fuel to maintain the proper temperature is about .5 cent an hour.



The National Garage Vulcanizer, the Product of a Cleveland, O., Concern.

A high grade steam gauge and safety valve are provided. The body of the machine is of semi-steel and all other parts are of cast iron. All vulcanizing surfaces are carefully machined and the maker points out that there is nothing to get out of order. It is claimed that about $120 worth of work can be turned out in 10 hours and that the entire outfit weighs but 70 pounds. The company is making a special offer for the present. the market.

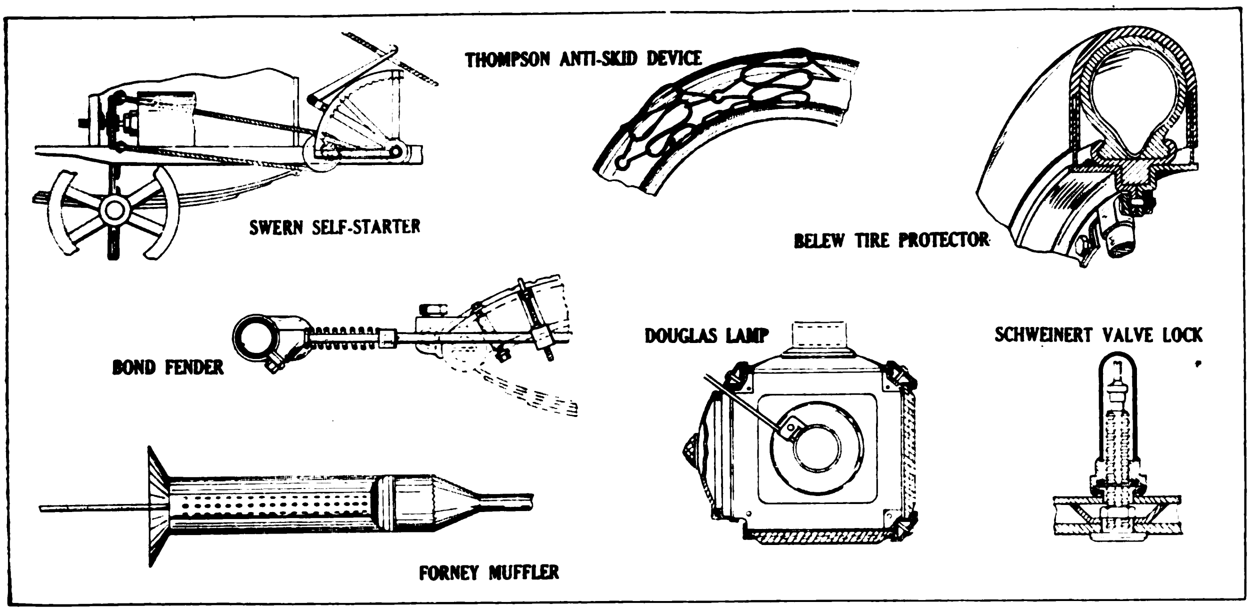
RECENT PATENTS of INTEREST

Swern Self-Starter.

Among the recent patents granted for starting devices for attachment to internal combustion motors is that of Ernest V. Swern, Denver, Col., assignor of one-fourth to John H. East of the same city. The self-starter is manually operated by pedal located in a position convenient to the driver and depressing the pedal actuates a lever which in turn imparts energy to the starter proper which is attached to the front of the motor. The mechanism comprises a sleeve mounted upon the engine shaft and having an external spiral groove, and a clutch member loosely mounted on the sleeve. The clutch has a projection within the spiral groove whereby a rotary movement of the member is converted into a simultaneous movement of the same in one direction with relation to said sleeve, and a spring between the sleeve and a stationary surface opposes its movement in the opposite direction.

Douglas Lamp.

A patent for a motor car lamp has been granted to Harry A. Douglas, Chicago, assignor to the Adams & Westlake Company of the same city. It has an upper and lower section which are united by a set of frame bars, the marginal portions of which are bent to form seat panels and panel engaging shoulders. A set of panels engage these seats and have instanding flanges slidingly engaging the upper shoulders and the margins of the top and bottom sections. Clamping bars bind the panel sections to their seats.



Some Recent Patents Applicable to the Motor Car, Including a Self-Starter and Other Accessories.

Thompson Anti-Skid Device.

An anti-skid device which resembles in construction the usual tire chain, has been patented by Langdon S. Thompson, Jersey City, N. J. It comprises a series of multiple reversed loop bands arranged around the shoe, connected by intermediate links. The anti-skid members are alternately reversed and the loop members are graduated in size, increasing from the retaining chain to the centre of the tire.

Forney Muffler.

With the authorities of the various cities and towns enforcing the laws against the use of cut-outs, inventors are devoting their efforts to devise a muffler which will reduce back pressure to a minimum as well as be silent in its operation. Samuel W. Forney, Pulaski, Va., has been granted a patent for a muffler which comprises an outer casing having a flanged end and a pipe mounted therein. This tube is enclosed in a second casing and is provided with perforations. Branch pipes are also fitted, these having their inner ends secured in said perforations and their outer extremities connected to the openings of the casing. The burnt gases are broken up by a conoid deflector before entering the mixing chamber.

Schweinert Tire Valve Locking Cap.

Maximilian Charles Schweinert, West Hoboken, N. J., has patented a locking cap for tire valves and the like. A nut is utilized in combination with a swiveled part, these members having a recess formed between them in which is fitted a notched disc, which is adapted to engage one of the parts. A spring is connected with the other and employed to engage with the corrugated disc. The latter rotates with the nut and has an opening any diameter of which equals that of the bore of the nut.

Belew Pneumatic Tire Protector.

Charles A. Belew, San Diego, Cal., has been granted a patent for a pneumatic tire protector which not only is claimed to protect the shoe from contact with sharp stones, etc., but it completely envelops the casing. It conforms to the tread of the tire and completely encloses it. Extensions are provided on either side of the protector and these pass under the rim of the wheel and are secured by means of bolts and locking nuts. The inventor claims that not only is the shoe protected from injury but all dirt and moisture are excluded from the casing.

Bond Fender.

Jayson K. Bond, Milwaukee, Wis., assignor of one-half to Kenneth W. Jacobs of the same city, has been granted a patent for a fender applicable to the motor car. It is secured in a manner similar to those of usual construction and is equipped with a buffer carried by a pair of plunger rods. These extend through eyed brackets and the openings of guide blocks. Coiled springs are interposed between the brackets and the buffer and stops are fitted for limiting the forward movement of the plunger rods.

OTHER PATENTS GONE TO ISSUE.

Wheel Rim, James Ellis Hale, Akron, O., assignor to the Goodyear Tire & Rubber Company, Akron, O. Dual detachable rim having split expansion rings and means for securing same.

Water Cooling System, Russell Huff, Detroit, assignor to the Packard Motor Car Company, Detroit. Comprising water jackets, radiator and a multiplicity of conduits leading from upper and lower sections of cooler to pump and water manifold of cylinders.

Lamp Attachment, George S. Sherman, Great Neck, N. Y. A vehicle lamp bracket in combination with a support having a ball and socket bearing and means for swinging said bracket.

Automatic Headlight, George T. Tribe and John M. Bemis, Worcester, Mass. Lamp standard rotably mounted, including hinged plate, a lever plate and a screw plate, as well as means for raising and depressing the lamp to any desired angle.

Resilient Wheel, James R. Wright, Trenton, Mo. A wheel having a hub, a rim comprising a plurality of loosely coupled sections, links arranged at right angles to and offset from centre of hub and connecting the sections, also bowed springs for connecting the adjacent ends of the sections.

Acetylene Generator, Fay H. Young, Rockford Ill. The end, forming a water reservoir in the upper compartment. The fluid flows between the casings to the carbide which is contained in a removable holder.

Shock Absorber, Charles O. Browne, Norwood, O. Two cylindrical casings telescoping and having a piston in a compression chamber and so designed that the movement of the piston in one direction will draw out the compression cylinder against the vacuum pressure.

Guy for Tops, Helen M. Ormsby, Xenia, O. An attachment plate is secured to the frame of the car or vehicle and a similar member has a stud adapted to engage with the permanent plate.

Vehicle Tire, George E. Starn, Camden, N. J., assignor by mesne assignments to Starn Tire Manufacturing Company of the same city. The traction member is of solid material and resiliency is obtained by means of an inflatable tube positioned between the outer tire and the rim of the wheel.

Lamp Attachment, Arthur Gale Thompson, San Francisco. The headlights are rotated with the front wheels, the actuating mechanism comprising a turntable plate, an arm and means for attaching same to the steering gear of the motor car.

Explosive Motor, Gustav A. F. Ahlberg, Chicago. The engine is of the two-cycle type and is fitted with an air compression chamber and means for conveying the air to the crankcase and combustion chamber of the motor with each compression stroke of the piston. A valve is incorporated for regulating the volume of air admitted.

Spring Wheel, George Dorffel, Oakland, Cal. Two rims are employed, a traction and an inner member, and between these are placed coil springs. Every other spoke of the wheel passes through the inner rim and is provided with a spring secured to the hub.

Headlight Operating Mechanism, James Madison Fryer, Middletown, O. The lamp is carried upon a shaft which is actuated by the steering gear of the automobile and a spring is utilized to maintain the engagement of the operating mechanism with that of the steering gear.

Grip Tread for Tires, Carlton L. Hoff, York, Penn. The traction members comprise chains, one of which is extended around the tread of the casing and secured by three other chains having links, securing and adjusting means.

Automobile Bumper, Friedrich Lederer, Milwaukee, Wis. A bumper or fender for motor cars comprising means for securing to extension of frame, a bumper carrying arm and a coil spring slidably mounted on said arm and fitted with a bumper bar.

Compression Grease Cup, Omer E. Risser and Peter E. McSweney, Springfield, Mo. A grease cup having an externally threaded plug screwing into the cup proper and a locking pin.

Gasoline Filter, Charles A. Port, John E. O'Neal and Dorace E. Motz, Pagosa Springs, Col. The combination of a fuel tank, water holder and a filter, the latter being so designed as to separate water from the gasoline and convey it to a discharge pipe as well as means for retaining the filtered fuel.

Motor Starter, Frederick G. S. Hewitt, Detroit. Fuel is taken from a supply chamber and forced to the combustion chamber by means of a pump. The mixture is ignited by a spark in the usual manner but a separate ignition system is provided, this being operated by dry cells.

Flexible Shafting, James D. Scovel, Detroit. A flexible shaft having in combination a series of interchangeable bars having hooked ends, a two-part guard for forming each bar into a loop at each end, a shell engaging over the meeting line of the two-part guard, and means for preventing longitudinal movement of the shell.

Fender, Adolph H. Luebke, Montello, Wis. Two front cross bars are utilized, spring members being interposed between them.

Locking Grease Cup, Thomas A. Walker, Evansville, Ind. A combination of a grease receptacle and plunger and having a screw threaded connection and an arc shaped spring and locking pin.

Latch Lever, William C. Azbill, North McAlester, Okla. The lever differs from those of the usual type in that the latch member is operated by rotating the handle, the movement engaging and releasing the tooth engaging the rack.

Buffer, Frederick C. Ferhman, Groffs Store, Penn. A pair of telescoping cylinders are employed, one carrying a coiled spring, and to the outer member is fitted the buffer bar.

Filter, Frederick H. Stubbe, New York City, assignor of one-half to John C. Klatzl. The filter is cylindrical in shape and is provided with a baffle plate to control the flow of the fluid, also screens and means for separating foreign elements from the gasoline.

Self-Heating Soldering Iron, Roy Merle Jett, Greenville, Ill. A soldering iron having a combined handle and fuel receptacle connected by a yoke, a hollow soldering point and jet and burner nozzles.

Nut Lock, William A. Moore, Gaithersburg, Md. The combination of threaded bolts and a nut, said threaded passages engaging and gripping each other.

Engine Starter, William S. Grigsby, Denver, Col. A starter in combination with the engine shaft of an explosive motor, two co-operating gears, means for rotating said gears and a spring device for compensating back firing of the motor.

Explosive Engine, George F. Dillon, Kansas City, Mo. An explosive engine having a hollow piston reciprocative in the cylinder and having a closed end, a bar supported by the body transversely to the longitudinal centre of cylinder, and an abutment slidably mounted and fitted in the piston.

To Drill Large Holes—To drill a large hole clean from the start without jumping or chattering in the least, take a small piece of old rag or waste about the size of the end of the drill; place it under the point of the drill, and then drill through the rag or waste. This idea may be used to a great advantage in countersinking work which requires a clean finish.

Brass Polish—Take three ounces of powdered rotten stone, two ounces of pumice stone, four ounces of oxalic acid, two quarts of rain water. Mix together and let stand several days, when it is ready for use. Shake well before using or applying. Polish with a dry woolen cloth or chamois skin.

Receipt for Case Hardening Iron—One ounce each of blue vitriol, borax, prussiate of potash and charcoal; two pints of common salt; one gallon of linseed oil; one quart of boiling water. Pulverize the solids and boil in the water, and then add the linseed oil. Heat the iron to a cherry red and immerse, stirring the mixture while it is cooling. By using this it is claimed edge tools can be made out of iron.

Drawing Temper From Brass—Brass is rendered hard by rolling or hammering. Temper may be drawn from brass by heating it to a cherry red and then simply plunging it into water, as though steel were to be tempered.

Rubber belts are liable to harden after considerable use. To render [illegible] soft and pliable, immerse in moderately warm water for about half an hour. It should then be put on the machine and run while in this condition. It will not return to its old hardness.

TIME CLOCK RECORDERS FOR GARAGES.

TWO or three problems stand out pre-eminently in the successful conduct of a public garage and service station. The proprietor who gives careful attention to business details realizes that there are many places in which leaks are liable to occur. It is not always so easy to determine just what is causing the leaks or to suggest a remedy, although it generally follows that the remedy is much more readily discovered than the leak.

The garage which is just starting in business in a small city or town is prone to count the cost, which sometimes means that conditions are overlooked in which it is possible to waste many times the money that would be expended in guarding against such situations. It is well enough to cut down expenses, but the successful business man is aware that there are ways of saving money by making wise expenditures.

Few garage proprietors will be disposed to criticise the statement that there is grave danger of losses which materially affect the profits of the business. It is only necessary to cite the instance of the customer who habitually "borrows" a little gasoline to clean his hands, or the man who persists in using the firm's tools to make minor adjustments on his car. Such small items, in the aggregate, make up a substantial total during the week, month or year.

But these are minor problems. Most garagemen find ways to overcome these difficulties, despite the fact that it may cost a trifle to secure locking devices which protect the gasoline tank and the tool box. They represent minor leaks, and while it is important to guard against them, it should not be forgotten that still other problems can be solved as easily.

Some garage proprietors lose sight of the fact that it is as important to retain customers as to secure them in the first place. Satisfactory workmanship is not the sole requisite. The job may be performed in the most careful manner, but if the owner once gains the impression that he is being overcharged, it is a difficult matter indeed to disabuse his mind. A better way is to convince him from the outset that he cannot be overcharged.

The desirability of adopting some method of recording the time at which work on a given job was begun and ended, has been commented upon freely in these columns. Without doubt the best scheme is that known as a time recording clock, and the truth of this assertion is borne out by the fact that the utility of the device does not end with its use in checking up given pieces of work.

The time recording clock is familiar enough to those who have had occasion to watch its operation in factory and department store service. By its use it is possible to record the time of arrival and departure of the employees, thereby simplifying the matter of bookkeeping in connection with the payroll. And it is only necessary to take a step further in its utilization in order to realize its full benefits to the garage business.

The cost is not excessive. Several makes are available. Herewith is presented the product of the Cincinnati Time Recorder Company, Cincinnati, O. It is known as the standard cost keeping machine, style 14, and has been designed especially for automobile garage use.

Contained within a polished solid oak case, the mechanism is operated by an eight-day Seth Thomas clock movement. It is constructed to last an ordinary business lifetime, and is built with a one-piece frame with well baked Japan finish, the small parts being with gun metal finish and polished nickel. The length is 34.75 inches, width 15.75, and depth eight. It is claimed to be entirely automatic in action, with no shifting device of any kind. It prints the day, A. M. or P. M., hour and minutes, and a decimal wheel can be furnished in place of the minute wheel, if desired. In short, it is a machine particularly adapted for accuracy in figuring cost.

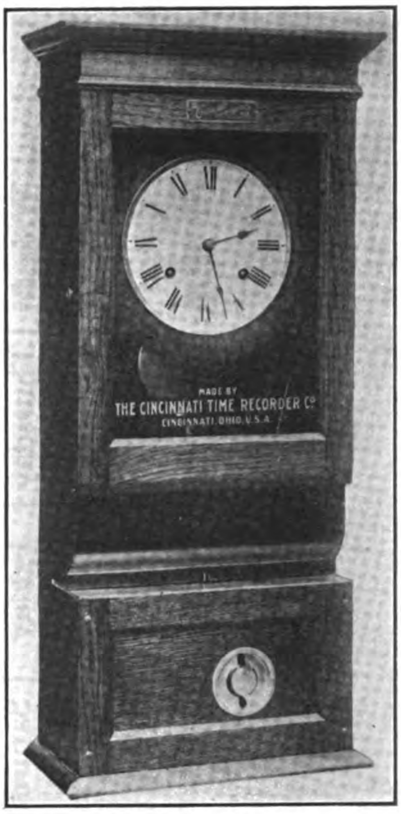
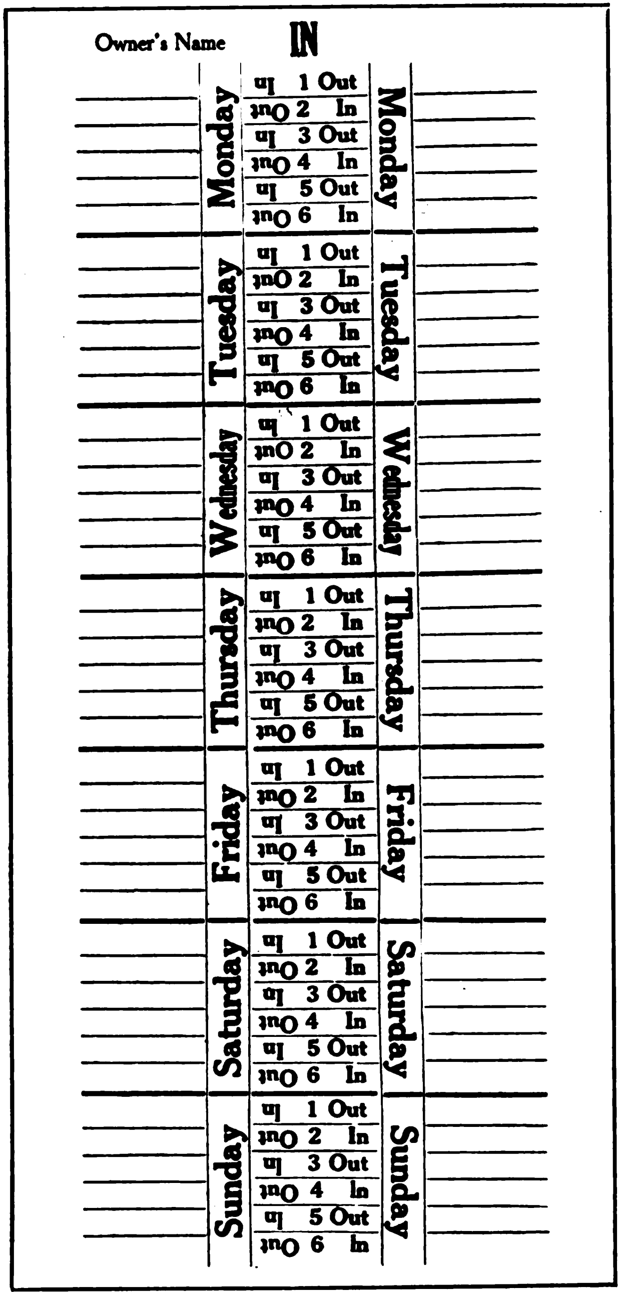


Fig. 1—The Cincinnati Time Clock Recorder.

Several blanks also are presented, indicating some of the uses to which the machine may be put in garage work. That at Fig. 3 A represents the employee's record card. On the obverse side it will be noted that provision is made for recording the time of arrival and departure of the workman for seven days. The "in" and "out" spaces on this side make it possible for the proprietor to know exactly at what hour the workman reported for work in the morning, went to lunch at noon, returned from lunch, and quit at night. On the reverse side are similar spaces, one portion of the card being reserved for overtime only, and the other for time out or lost time.

By means of this card it always is possible for the proprietor to tell at a glance whether or not his workmen are prompt and efficient. It will be noted that the machine is adapted to print upon any portion of the card, 8.25 by 3.375 inches.

Fig. 3 B presents the card utilized in keeping track of the work. As soon as the repairman begins work he runs the card through the clock, thereby securing an impression of the exact minute at which work was begun. If he is called off for any purpose, he first runs the card through the clock, then puts it in a case provided for that purpose, where it is readily accessible when he resumes work on this job, after again securing an impression of the time on the card.



Owner's Name **IN**

	Monday	uI	1 Out	Monday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		
	Tuesday	uI	1 Out	Tuesday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		
	Wednesday	uI	1 Out	Wednesday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		
	Thursday	uI	1 Out	Thursday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		
	Friday	uI	1 Out	Friday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		
	Saturday	uI	1 Out	Saturday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		
	Sunday	uI	1 Out	Sunday	
		ʇnO	2 In		
		uI	3 Out		
		ʇnO	4 In		
		uI	5 Out		
		ʇnO	6 In		

Fig. 2—Showing Card Used to Check the Arrival and Departure of Each Machine—Copy of Record Is Sent to Owner.

At the bottom of the card will be noted a space for the noon hour registration. It will be seen that it would be possible to utilize this card for one job or any number of jobs, keeping an accurate account of the time expended on each. It might also be used in lieu of that at A, as a record of the workman, although in such cases it would necessitate rather more figuring to obtain the desired information. The best arrangement would be to utilize one card for each job.

On the reverse, provision is made for keeping track of the total time expended upon a given job or jobs, and where it is found desirable to utilize this card for an employee's record as well, sufficient information is available to assist the bookkeeper in making up the payroll. The size is the same as that at Fig. 3 A.

Probably no problem has caused the garage proprietor more concern than that of keeping watch of the cars in his care, so that none but those entitled to use them shall do so. Of course, it has been demonstrated that no owner can hold the garage liable for damages sustained in the so-called joy ride. No concern could remain long in business if such view of the matter were genererally taken.

When the garage proprietor has taken every precaution to deliver the machine to none but the authorized agent of the owner, his responsibility ends. Still, when it is considered that it is desirable to give a service which shall attract and retain custom, any proposition which will aid in solving this problem will be appreciated. And it is in this respect that the Cincinnati Time Recorder Company claims for its product a distinct advantage.

Without in any manner assuming the responsibility for the machine, the garage equipped with one of these clocks is in a position to render a valuable service to its customers. It may be added that several of these clocks are being utilized in this manner in the large garages of New York City, and that the results have been decidedly successful.

The card at Fig. 2 suggests the method. It will be noted that the card is divided into daily spaces, providing for the seven days of the week. Experience has indicated that six trips a day is about the largest number required for the ordinary garage. Each time the car is driven out of the garage the card is slipped into the clock, and a record is secured. As soon as it returns another record is obtained in the same manner.

Of course, it is necessary to assign some one to the duty of inserting the cards. It would not do to allow this duty to devolve upon the owner or chauffeur, so it must be an employee of the garage. In most cases some one in the establishment is assigned to look after cars when they go out or come in, but in the New York City garages mentioned the matter of securing the records is left to the young woman who cares for the telephone exchange, or to the bookkeeper.

This card is intended as a report. It may either be shown to the car owner at the end of each day or week, as desired, or it may be printed in copying ink, and after a press copy has been made for filing, the card itself is sent to the owner. The reverse side provides for the owner's name, make of car, storage report, garage advertisement and such remarks as may be necessary. The size is 9.125 inches long by 3.5 wide.

Let it be assumed that the owner has reason to suspect that his car is being used by the chauffeur without his consent. The garage equipped with one of these clocks and a set of cards is in a position to report to the owner at all times, just when his car left the garage, how long it was gone, and how many times a day it was being used. It is seldom indeed that the chauffeur ventures upon an extended joy ride at the first opportunity offered. If the report indicates that he is in the habit of taking more time to deliver the car to the garage than seems necessary, or any other lapse of duty, the owner is notified at once, and the possibility of a damaged machine is reduced thereby.

If the garage proprietor cannot afford to assume the responsibility for the improper use of a machine on storage, neither can he afford to relax his watchfulness over the cars in his charge. The possession of the clock does not eliminate the necessity for the other little means of checking against failure in this regard. But where it is possible to afford a service of this nature, in conjunction with the utilization of the clock as a time check on the employees and on the work of customers, it is easy to be seen that the recording device will pay for itself in a reasonably short time.

The loss of time on the part of employees is of moment. The possibility of losing a customer through inability to convince him that the entire time for which he has been charged was expended in work upon his car is decidedly important. The additional feature of providing a daily report of the car's movements, insofar as the garage itself is concerned, has a distinct value. Little attempt has been made herein to do more than suggest the possibilities. Numerous other ways of saving money can be cited by the garage owner himself. The need for system is imperative in the successful conduct of any business, and it is even more than ordinarily important in the garage and service station.

NEW ELECTRIC CAR.

Chicago Concern Places Its First Model in the Market and Begins Active Work.

The Chicago Electric Motor Car Company, Chicago, has presented its first Chicago electric car, designed by President Frederick J. Newman, who has been connected with a number of such makers in a similar capacity. It is understood that an effort will be made to produce these vehicles in such quantities as to compete directly with gasoline machines in every phase of the selling campaign. The company expects to have several cars ready for demonstration in the near future and to have the factory working at full capacity this fall.

According to President Newman, the body design is not unlike that of the Pierce-Arrow gasoline car. This and the chassis, motor and battery features are the result of long experimentation, and it is anticipated that the assembly will receive ready acceptance by a discriminating public.

PURCHASE ESTERLINE COMPANY.

Prest-O-Lite Owners Will Move Plant to Indianapolis and Enlarge Its Scope.

Announcement was made a few days ago that one-half of the capital stock of the Esterline Company, Lafayette, Ind., which totals $250,000, has been purchased by Carl Fisher and J. G. Allison, owners of the Prest-O-Lite Company of Indianapolis. The plant will be removed to Indianapolis, where it will be located at Speedway, the new "horseless city" recently established by the new owners. There is to be no change in the management of the company.

The Esterline Company is manufacturer of the Berdon system of electric lighting and has orders booked for more than $1,000,000 worth of this product. However, it is stated that the concern has been experimenting for the past year on a combined electric starting and lighting equipment.

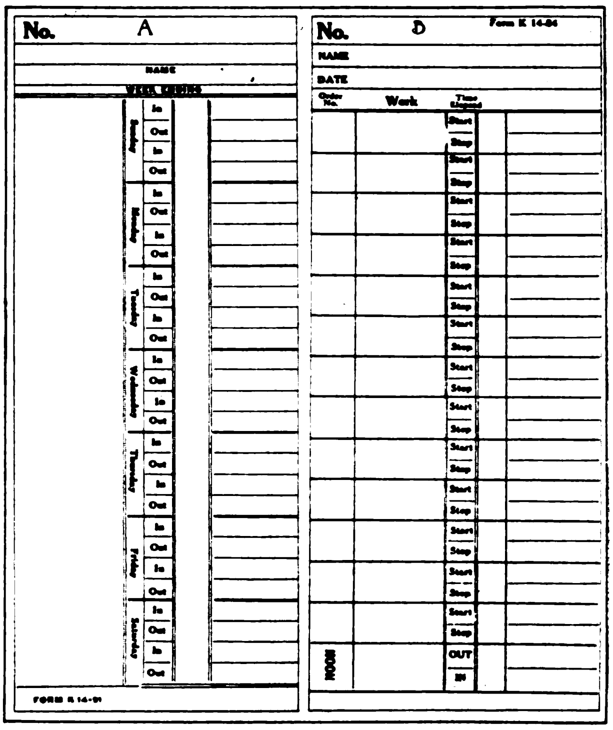

No.
A
Name
In
Out
No.
B
Name
Date
Work
Start
Stop
Noon
Out
In

Fig. 3—Cards Used in Cincinnati System: A, Employee's Blank Stamped by Recording Device; B, Card Used for Keeping Track of the Work.

The Esterline starter is to be unique in many respects, it is stated, and a rather radical departure from the electric starting devices already on the market. It goes without saying that it will incorporate those features of design making for convenience, simplicity and reliability, which have marked the success of the Berdon system.

Still another departure is the production of a new lamp, the reflecting surface of which is of a material which will not scratch or tarnish. A recent test of these lamps was made in Detroit, at which it was demonstrated that in a dense fog a 16 candlepower bulb in front of one of these new reflectors, projected its light six times as far as the rays from a 2000 candlepower arc lamp.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following concerns have been incorporated recently to manufacture and deal in motor cars, trucks, accessories, etc.:

Pioneer Motor Car Company, Troy, N. Y.; $10,000; directors, Henry J. Richardson, Troy; George N. Way, Hudson Falls, and others.

Hallett Vehicle Tire Company, Augusta, Me.; $500,000; to manufacture automobile tires; president, J. L. Coleman; treasurer, C. E. Beebe.

Park City Auto Company, Ashland, Ky.; $10,000; incorporators, Howard Elhoff, B. E. Tate and others.

Oconto Falls Motor Car Company, Oconto Falls, Wis.; $5000; incorporators, J. H. Delbridge, W. J. Munser and others.

Millbridge Motor Company, Millbridge, Me.; $10,000; president, Joseph Sawyer; treasurer, James S. Wyman.

Hill-Stage Company, Anderson, Ind.; $5000; to manufacture automobile repairing machinery; directors, Hugh, Forest J., and E. N. Hill and H. C. Stage.

Miller Auto Company, Jacksonville, Fla.; $10,000; to engage in automobile and garage business; president, F. C. Miller.

Kilbourne Thompson Company, Fort Wayne, Ind.; $50,000; to manufacture and sell automobiles; incorporators, Frank B. Thompson, Frank B. Dulin and others.

A. J. Meyer Motor Car Company, Cedarburg, Wis.; $25,000; incorporators, John Armbruster, Jacob Dietrich and others.

Sheboygan Auto & Supply Company, Sheboygan, Wis.; $25,000; to operate a garage.

Uneeda Tire & Sundry Company, Los Angeles, Cal.; $25,000; to sell automobiles, aeroplanes and accessories; incorporators, Hugh M. Webster, Walker D. Kidd, George H. Kidd.

C. U. Williams & Sons Company, Bloomington, Ill.; $100,000; to do a general automobile business; incorporators, C. U. Williams, Frances W. Williams and others.

Industrial Motor Company, Middletown, N. Y.; $350,000; to manuafcture automobiles; incorporators, W. A. Courtland, M. G. Crawford and others.

Des Moines Garage & Manufacturing Association, Des Moines, Ia.; $25,000; president, G. F. Knorr.

E. C. Andrews Company, Boston, Mass.; $40,000; to produce automobile furnishings; incorporators, Everett C. Andres, E. Russell Lynn and others.

Clinton Automobile Company, Hoboken, N. J.; $10,000; to manufacture and deal in automobiles, etc.; 132 Third street, Union Hill; incorporators, B. F. Krom, W. A. Schuette and others.

Franklin Auto Company, 120 Broad street, Elizabeth, N. J.; incorporators, William H. Reynolds, William H. Reynolds, Jr., Morris Gordon.

Southern Taxicab Company, Columbus, O.; $10,000; incorporators, James A. Allen, J. Keating and others.

Ideal Steel Wheel Company, Columbus, O.; $500,000; to make spring wheels for automobiles; incorporators, J. E. Streitelmeier, A. F. Parker and others.

South End Garage Company, Cleveland, O.; $5000; incorporators, A. Backin and others.

Model Garage, Charlotte, N. C.; $25,000; incorporators, R. F. Prince, E. J. Jones, R. B. Cochrane.

Mutual Oil & Auto Supply Company, Cleveland, O.; $10,000; to deal in oils, supplies and accessories; incorporators; M. L. Steuer, H. C. Killiman, Herbert Haase, C. F. Franke, A. S. Kraus.

Western Auto Sales & Manufacturing Company, Omaha, Neb.; $50,000; president, A. W. Gilman; secretary, M. M. Seales.

E. W. Johnson Company, Fresno, Cal.; $7000; directors, H. M. Johnson, E. W. Johnson and others.

Auto Air Rotar Company, Portland, Me.; $15,000; president, Albert F. Jones; secretary, James E. Manter.

Marrs-Lingo Motor Company, Dallas, Tex.; $7500; incorporators, A. A. Marrs, D. C. Lingo and others.

WITH THE MANUFACTURER

The Atlas Motor Car Company, Springfield, Mass., maker of Atlas cars, which has been in difficulty because of its inability to secure Knight engines according to the contract with the Atlas Engine Works, Indianapolis, Ind., which is now in the hands of a receiver and with which concern the Springfield company has no connection despite the similarity of names, is arranging for new capital, a recent meeting of the stockholders having provided a way for such action.

The Kissel Motor Car Company, Hartford, Wis., has appointed the following new agents for KisselKar pleasure and commercial lines: Lippart-Bishop Auto Company, Dubuque, Ia.; Zimmerman Steel Company, Lone Tree, Ia.; W. D. Sessum, Longview, Tex.; J. C. Bryant, Kaufman, Tex.; H. Lowenstein & Co., Marshall, Mo.; Brown Bros., West Point, Neb.; W. C. Evans, Sedalia, Mo.; Box Bros., La Crosse, Wis.; William C. Grace, Kalamazoo, Mich.; B. C. Kirkland, Battle Creek, Mich.; Ball-Washburne Motor Company, Rochester, N. Y.; Edward H. Bauer, Washington, D. C.; L. D. Collier, Salisbury, Md.; Howard Douglas, Nashville, Tenn.; D. L. Boureau, Regina, Sask., Can.

The Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, recently opened a new factory branch in a new building at Van Ness avenue and Sutter street, San Francisco, Cal. An accompanying illustration presents the exterior of the building, which is believed to be adequate to take care of the Pacific Coast business of the company for some time to come.

The Oakland Motor Car Company is having a $50,000 salesroom, garage and repair shop erected in Atlanta, Ga.

The Locomobile Company of America, Bridgeport, Conn., is to erect a garage and showroom at Atlanta, Ga.

Tent Employed by Henderson Motor Car Company as Auxiliary to Main Plant During Construction of Factory Additions.

The Moon Motor Car Company, St. Louis, Mo., has completed the addition to its factory, shown in an accompanying illustration. This comprises the entire fourth floor, which will give the company much needed room for the production of Moon cars.

The Edwards Motor Car Company, 1734 Broadway, New York City, maker of Edwards cars, in which C. G. Stoddard and H. J. Edwards are the principal owners, has chosen Long Island City, N. Y., as the location for its new plant. The company has taken a factory under lease for a year, until it can make arrangements to build. The first models will be offered for sale in the near future.

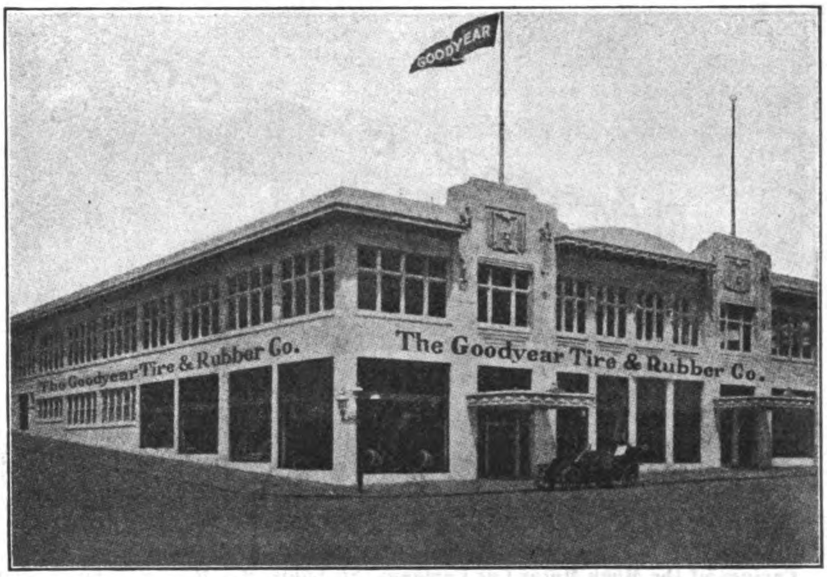
The Henderson Motor Car Company, Indianapolis, Ind., maker of the Henderson car, has been forced to utilize a tent, while awaiting the completion of its factory addition, beeause of the increase in producion made necessary in order to keep abreast of the orders. New agencies are announced as follows: J. F. Tentant & Co., Chicago, Ill.; F. D. Parker, Decatur, Ill.; Meade McClatchey, Canton, Ill.; Standard Motor Car Company, Ltd., Edmonton, Alta., Can.; Forest Park Garage, Springfield, Mass.; F. W. Davis & Sons, Fall River, Mass.; Charles Frederick, Bay Ridge, N. Y.; Harold C. Slater, East Orange, N. J.; L. E. Grider, Fresno, Cal.; Thesan & Gronewald, Golden, Ill.; Elmer S. Maine Company, Hubbard, Ia.; Automobile & Supply Company, Lancaster, Penn.; E. C. Graham, Lindsay, Cal.; D. & W. Lawson, Northport, N. Y.; J. J. Tanner, Petaluma, Cal.; Forbes Motor Car Company, Pittsburg, Penn.; Sacramento Motor Sales Company, Sacramento, Cal.; H. F. Hunter, Swedesboro, N. J.; Auto & Truck Sales Company, York, Penn.

The Federal Motor Truck Company, Detroit, announces the following new agencies for Federal trucks: W. S. Young, Larned, Kan.; Union Motor Car Company, Pittsburg, Penn.; Gibbes Machinery Company, Columbia, S. C.; Cole Motor Company of Georgia, Atlanta, Ga.; Fairchild Auto Company, New Orleans, La.; Mobile Auto Company, Mobile, Ala.; John F. Gubbins, Memphis, Tenn.; Eckenroth Sales Company, Cleveland, O.; Sanderson & Burghardt, Buffalo, N. Y.; Interstate Auto & Supply Company, Sioux City, Ia.; L. C. Hayden, Tecumseh, Mich.

The Nordyke & Marmon Company, Indianapolis, Ind., maker of Marmon cars, has added the following agents to its list: R. C. Bowman, Wheeling, W. Va.; Lion Auto Garage, Winnipeg, Man., Can.; Lougheed & Webster, Calgary, Alta., Can.

The Mercer Automobile Company, Trenton, N. J., announces the following additions to the list of Mercer agencies: Mercer Sales Company, Minneapolis, Minn.; Sitgreaves Auto Livery, Columbus, O.; R. L. Culbertson & Co., Youngstown, O.; C. J. McFarland, Wapakoneta, O.; Pine Bluff Motor Car Company, Pine Bluff, Ark.; Terminal City Motor Company, Vancouver, B. C.

The R-C-H Corporation, Detroit, maker of the R-C-H car, has added the following agents: Wallace & Tolar, Inverness, Miss.; H. A. Walton & C. W. Ellington, Roswell, Ga.; W. H. Ratcliffe, Alexandria, La.; S. H. Watts, Selma, Ala.; Automobile & Marine Motor Company, Charleston, S. C.; Albert C. Jones, Rockland, Me.; A. Elliott, Rochester, N. Y.; Robert L. Hiller, Batavia, N. Y.; F. Ebann, Chicago, Ill.; H. L. Webber, Wenona, Ill.; John E. Briggs, Williamsport, Ind.; May & McPheeters, Hardingsburg, Ind.; W. C. Sporleder, Chicago, Ill.; Karl B. Gast & A. A. Gast, Akron, Ind.; G. F. Wisegarver, Decatur, Ill.; Jackson Kline, Howard, Penn.; P. W. Pittman, Las Animas, Col.; E. L. Bradford, Albuquerque, N. M.; Carlsbad Auto Company, Carlsbad, N. M.; Crescent Garage, Deming, N. M.; Pecos Valley Auto Company, Roswell, N. M.; Frank Vegely, Santa Ana, Cal.; Alfred S. Donan Auto Company, Tucson, Ariz.; A. R. Riley, Riverside, Cal.: Boyce & Born, Green City, Mo.; G. R. Jones, Wichita, Kan.; John Nelson & Son, Ottawa, Kan.; Michael & Sappenfield Garage Company, Scranton, Kan.; P. C. Jonas, Le Roy, Kan.; Northrupp & Clark, Houston, Tex.; B. W. Carrington, Grand Salene, Tex.; Baker & Wilson, Nacogdoches, Tex.; Western Machine & Motor Company, Wessington Springs, S. D.; W. J. Baribeau, Enderlin, N. D.; L. L. Grier & L. S. Peters, Lake Wilson, Minn.; Wallace Donnelly Company, Jamestown, N. D.; E. Dieudonne & Son., Jamesville, Minn.; Walter H. Flessel, Huntington, N. Y.; I. R. Gardiner, Utica, N. Y.; W. H. Dykeman, Bayonne, N. J.; Cannon Electric Company, Bristol Landing, N. J.; Souderton Garage, Souderton, Penn.; Samuel F. Garrison, Bordenton, N. J.; Cortland L. Fort, Burlington, N. J.; Middleton Motor Company, Marlton, N. J.; McKenney & McKenney, Gilroy, Cal.; E. W. Johnson Company, Fresno, Cal.; E. E. Gross, Stockton, Cal.; F. H. Kuhn, Plymouth, Ind.; Henrickson & Smith, Live Oak, Cal.; J. W. Cramp, Rialto, Cal.; Worthington Auto Company, Aberdeen, S. D.; A. F. Lauson & Co., Burlington, Vt.; C. O. Scranton, Alliance, O.; Clark & Smith, Whitetown, Ind.; John C. Gelmers, Chatsworth, Ill.; L. G. Schoopflin Company, Buffalo, N. Y.; R. Kloopwell, Jacksonville, Fla.; Henry Muntz Company, Elgin, Ill.; V. L. Rogers, Jr., Memphis, Tenn.: A. H. Ward, Arlington Heights, Mass.; J. B. Kelly, Chicago, Ill.; E. C. Miller, Milledgeville, Ill.; Schram Bros., Addison, Ill.; H. H. Collier, Belvidere, Ill.; Akron Auto Garage Company, Akron, O.; Sofield Automobile Company, Asbury Park, N. J.; R. E. Powell, Onancock, Va.; Pearson & Pearson, Edwardsburg, Mich.; Shattuck & Son, Covert, Mich.; Northampton Motor Company, Jackson, N. C.; R. H. Troutman, Statesville, N. C.; Hammond-Ballard Company, Long Beach, Cal.; J. J. Schutz, St. James, Minn.; Harvey Hertzler, Thompsontown, Penn.; James G. Klock, Laramie, Wyo.; Weir-Moor Motor Company, Monmouth, Ill.; A. A. Sanford, Lodi, O.; Asheville Auto Company, Asheville, N. C.; C. L. Dobbs, Devils Lake, N. D.; William Heinen, Delano, Minn.; Bunn & Goembel, Pipestone, Minn.; Schroeder & Son, Chicago, Ill.; George H. Custer, Collingdale, Penn.; Don Chamberlain, Kennebunk, Me.; Lawton Motors Company, San Antonio, Tex.; J. A. Ewing and A. R. Atkins, Kent, O.; T. J. Collins, Northampton, Mass.; Weber Implement Company, St. Louis, Mo.; Charles E. Hammerly, Chicago, Ill.; John Bauer, Jr., Strasburg, Ill.; Niagara Falls Auto Transit Company, Niagara Falls, N. Y.; W. A. Struve, Bloomer, Wis.; W. Middleton Sheppard, Bridgeton, N. J.; George W. Turner, Shamokin, Penn.; Ulster Garage, Kingston, N. Y.; F. M. Cole, Osborne, Kan. Olson-Heming Auto Co., Morris, Minn.; Smith Motor Car Company, Hazleton, Penn.; Shaffer Manufacturing Company, Baltimore, Md.; W. L. Reisinger, Newport, Penn.; Model Garage, Lynchburg, Va.; Yale Motor Company, Camden, N. J.; Peters & Kittell, Hornell, N. Y.; Willard Morris, Dansville, N. Y.; F. E. Wickwire, Elmira, N. Y.; Slawson & Lounsbury, Jamestown, N. Y.; Cook Brothers, Castle, N. Y.; Muncie Motor Company, Pasadena, Cal.; William H. Hedges, Southampton, N. Y.; I. A. Silvie, Jr., Port Richmond, N. Y.; the Central Motor Car Company, New York City; James N. Bussey, Troy, N. Y.; Walter J. Connelly, Hartford, Conn.; Central Garage Company, New Canaan, Conn.; O. W. Smith, New Philadelphia, O.; Vincent & Hurd, Hiram, O.; Old-Oakland Motor Company, Cincinnati, O.; Drayton Auto Company, Drayton, N. D.; White Bear Auto Company, St. Paul, Minn.


GOODYEAR
The Goodyear Tire & Rubber Co.
The Goodyear Tire & Rubber Co.

New Building Occupied by Goodyear Tire Branch in San Francisco.

The Poss Motor Truck Company, Detroit, recently closed a large real estate deal, by which it secured a much larger factory than that at present occupied. The company will more than double, and possibly treble, its present output as soon as the change is made to the new quarters.

The United International Motors, Ltd., the foreign affiliation of the United States Motor Company, recently took new quarters at 212-14 Portland street, London. Eng.

E. E. Guthrie and Henry Winn of the Kansas branch of the R-C-H Corporation, Detroit, have returned to their duties after spending a week at the factory.

GARAGE & DEALER

W. H. Adams and J. E. Wilber of Mattapan, Mass., have opened the Blue Hill avenue garage at 1509 Blue Hill avenue, of fire proof construction and supplying 10,000 square feet of floor space. A specialty of first class repair work will be made.

The Meridan Automobile Company, Indianapolis, Ind., has sold its property and business at 724-730 North Meridan street, to the Waverley Company, which will use the property as a factory sales branch and garage for electric cars. It will be under the management of Henry C. Churchman.

O. E. Stoll is in charge of the new branch and service station recently opened in St. Louis, Mo., by the General Motors Truck Company.

The Rhineland Machine Works Company has opened an office and store at 1254 Michigan avenue, Chicago, Ill., which it will occupy with the American Electric Manufacturing Company.

The G. E. & H. J. Habich Company, New England distributor for the Cole automobile, made by the Cole Motor Car Company, Indianapolis, Ind., recently moved into new quarters on Bickerstaff street, Boston. The building is one of the best appointed service stations in the East.

H. B. Stant of 315 Broadway, Milwaukee, Wis., is planning to erect a garage on Summit avenue, to be of brick and stone construction, and to cost about $4000.

A. R. Carney, Visalia, Cal., has purchased the Home Auto & Machine Company's plant and has reopened it under the name of Home garage.

E. M. Greene, Salem, O., district manager for the Flanders Motor Company, Detroit, maker of Flanders cars (formerly the Everitt), has plans for a new garage in that city.

The F. E. Murphy Automobile Company, Minneapolis, Minn., has plans for a new garage to cost about $60,000, to be erected at 13th street and Hennepin avenue.

Carl E. Washburn, San Diego, Cal., is constructing an up-to-date garage at Second and Ash streets, in which the local agency for the Stutz, made by the Ideal Motor Car Company, Indianapolis, Ind., will be located.

W. G. Tennant, well known as the head of the Peerless Motor Car Company of New York, has resigned to assume the active management of the Tennant Motor, Ltd., 2447 Michigan avenue, Chicago, distributor for the Henderson, made by the Henderson Motor Car Company, Indianapolis, Ind.

The Potomac Motor Car Company, Washington, D. C., agent for the Marmon, made by the Nordyke & Marmon Company, Indianapolis, Ind., has leased the building at 1226 Connecticut avenue, and will make extensive improvements for carrying on his business.

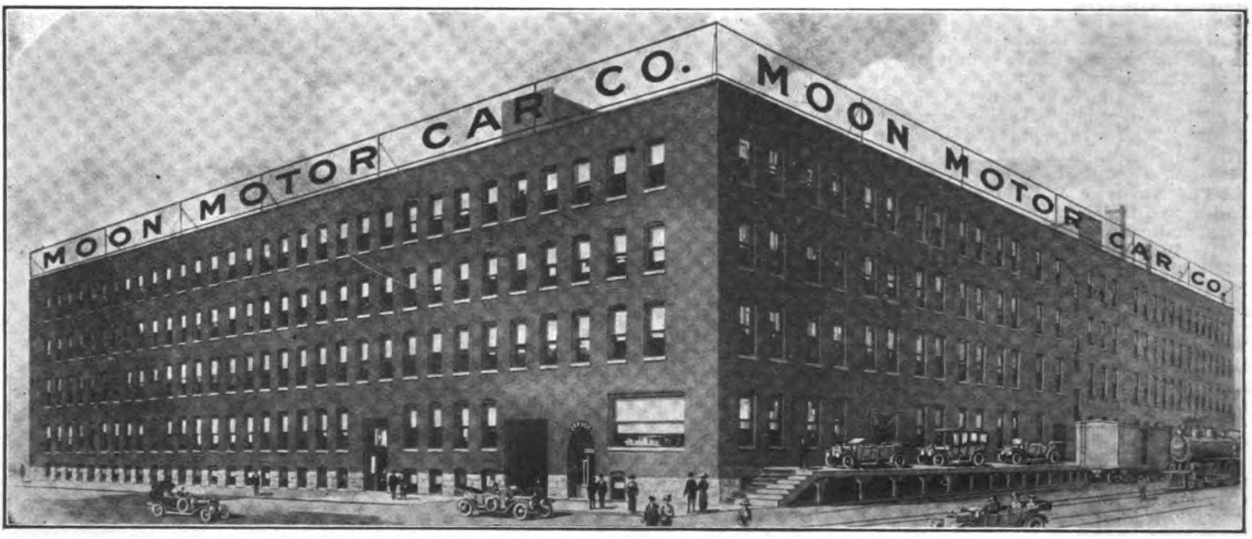
The Enterprise Auto Repair Company, 4037 Wabash avenue, Chicago, has been appointed agent for the Mea magneto, by the Chicago Mea Magneto Branch.

Huffer & Band-Haur, Phoenix, Ariz., has been appointed state distributor for the Moreland distillate truck, made by the Moreland Motor Truck Company, Los Angeles, Cal.

The Sheriff-Lawrence Company, 410 West North avenue, Pittsburg, Penn., has been appointed distributor for McIntyre pleasure and commercial cars, made by the W. H. McIntyre Company, Auburn, Ind.

The Rauch-Lang Company, Cleveland, O., plans to erect one of the most complete garages in the United States at a cost of $200,000. The location is at Euclid avenue and East 93rd street.

Howard L. Crise, Baltimore, Md., has taken new quarters at 1916 North Charles street, where he will carry a full line of automobile supplies, greases and oils, under the firm name of the H. L. Crise Auto Supply Company.



Factory of the Moon Motor Car Company, St. Louis, Mo., Recently Augmented by the Addition of the Fourth Story.

The Boulevarde Garage & Sales Company, 1405 Race street, Philadelphia, Penn., agent for the Warren, English Daimler and Mercedes, has added the Little Four, made by the Little Motor Car Company, Flint, Mich.

McKenney & Gilpin, Main street, West, Rochester, N. Y., has taken the agency for the K-R-I-T car made by the K-R-I-T Motor Car Company, Detroit.

The E. B. Lyon Motor Company, Durham, N. C., has filed notice of its intention to do business in South Carolina at Main and College street, Columbia.

H. F. Sundin, formerly with the National Motor Vehicle Company, Indianapolis, Ind., has opened a garage and service station for National cars at 11th and Locust streets, Kansas City, Mo.

The Horton Motor Company, Devils Lake, N. D., state agent for the Cadillac, made by the Cadillac Motor Car Company, Detroit, will open a garage and branch sales office at Fargo, N. D.

E. W. Gould of the Smithtown Automobile Company, Smithtown, Long Island, has sold the business to Edward Baxter, who already has taken possession.

Edward W. McDonough of South Orange, N. J., has taken the agency for the Little Four, made by the Little Motor Car Company, Flint, Mich., in Newark. F. T. Cogan of the latter city will act as manager.

Hugh Brown of Eagle Grove, Ia., has sold his Eagle garage to Robinson & Smalley. Various additions to the equipment will be made, and the building will be enlarged. The company markets the Overland line, made by the Willys-Overland Company, Toledo, O.

Edward Sellman and W. B. Read, Decorah, Ia., have taken the agency for the Overland, made by the Willys-Overland Company, Toledo, O.

Dr. Henry S. Paige, Amherst, Mass., has organized a company to operate a garage to accommodate 40 automobiles at 17 South Prospect street. An expert machinist will be placed in charge.

The Albert Boynton Motor Company, Red Bank, N. J., which has the agency for Overland cars in that vicinity, has leased the store at 24 Monmouth street, for its salesrooms.

Don P. M. McClure, Oskaloosa, Ia., has bought out the Anderson garage on First avenue, and is fitting up the premises to handle the Oakland cars, made by the Oakland Motor Car Company, Pontiac, Mich.

Arthur C. Kendall, Pasadena, Cal., manager of the California Automobile Company's branch in that city, has let the contract for the erection of a modern garage at Union street and Broadway, where the agency for Warren cars, made by the Warren Motor Car Company, Detroit, will be located.

The Carpenter Motor Sales Company, Los Angeles, Cal., has been incorporated for $500,000, to handle the local agency for Paige cars, made by the Paige Motor Car Company, Detroit, and the Dorris, made by the Dorris Motor Car Company, St Louis, Mo.

Andrew J. Caron of Lawrence, Mass., is to open a garage and repair shop on Kirk street, that city.

The Imperial Motor Car Company, Cincinnati, O., recently moved into a new service building and salesroom at 1609 Madison road, that city. The concern is agent for the Cole and Stearns cars.

William J. Damoth has opened a repair shop at Coopersville, Mich.

The Como Automobile Supply Company, Charlotte, N. C., has moved its offices and store rooms from 209 South Church street to 302 North Tryon street. Larger quarters were necessary to care for an increased business.

The Lyon Motor Car Company of Durham, N. C., is to open a display room in Columbia, S. C. The new building is in course of construction and will be occupied upon completion.

Ebner Wooden, Stockton, Kan., has purchased the interest of William Shaw in the Hockett Garage.

The Lincoln Garage & Repair Company recently opened a large garage in Kankakee, Ill. The concern has the agency for the Warren, made by the Warren Motor Car Company, Detroit, Mich., and the K-R-I-T, made by the K-R-I-T Motor Car Company, Detroit. The garage will carry a complete line of cars at all times, and accessories and parts for repairs so far as possible. The members of the firm are F. A. Babel, Walter Cobb, Charles H. Cobb and L. J. Meyers.

Edward J. LaFountaine, who was the Warren-Detroit agent in Minneapolis, has associated himself with the Haynes Knutson Auto Company, Minneapolis, northwestern distributor for the Cole car.

The Bournonville Realty Company, New York City, will build a two-story automobile service station at 241 to 245 West 64th street, 75 by 100 feet. The foundation will be so laid that additional stories can be built. The officers of the new company are A. Cressy Morrison, Percy Kent and Charles B. Gales.

The Shaffer Auto Supply Company, 1240 Broadway, Denver, Col., is the name of a new concern which will handle standard accessories and supplies. The agency for the Blair truck has been taken for Colorado.

The J-A-R Company, located at 932 Kansas avenue, Topeka, Kan., has closed a contract with the Lincoln Motor Car Works of Chicago, Ill., whereby it becomes distributing agent for Topeka and vicinity for the Lincoln light delivery wagon.

C. Barnum Seeley is to erect a concrete garage, 52 by 104 feet, on State street, Bridgeport, Conn., for the Oston Motor Car Company. The building will be well lighted and up-to-date in every particular.

White & Durgin, Haverhill, Mass., recently had completed one of the most up-to-date garages in that section of the state. The building is located on Main street, and has a frontage of 50 feet and a depth of 102 feet. It is practically fireproof, being of reinforced concrete and steel construction. The structure will be heated by steam, lighted electrically and well equipped in every respect.

Kirby & Hubbard of East Front street, Red Bank, N. J., recently secured a lease of the Vandorn building on East Front street, opposite the Globe hotel, and will open a garage and service station.

The Heydt-Haas Motor Company has taken quarters in the Point Breeze Garage, Reading, Penn., for the handling of Hudson cars, made by the Hudson Motor Car Company, Detroit. Irvin Heydt will take care of the sales end and Ralph E. Haas will act as technical manager.

The M. & L. Rubber Company, Darien, Conn., is installing an automobile repairing plant, which, when finished, will be one of the most up-to-date in the state. The firm is prepared, or will be soon, to do all kinds of repairing on both pleasure and commercial cars. C. W. Miegel is the manager and H. Lanyon, assistant manager.

C. K. Sutton, R. S. Sutton, J. Blair Sutton, Joha M. Miller and Joseph W. Clements have made application to the governor of Pennsylvania for the charter of an intended corporation to be called the Sutton-Miller Company. The concern will conduct a general automobile and garage business.

Charles Barker and others of Terryville, Conn., have formed a company for the purpose of opening and operating a garage in Bristol, in the same state.

The Corinth Auto Company was recently formed in Corinth, Miss., with a capital stock of $10,000. The concern will buy, sell and rent automobiles, make repairs and conduct a general garage business. The members of the company are W. A. Stewart, W. A. Hintin, T. F. Hinston and H. N. Young.

Duquesne Garden, Pittsburg, Penn., one of the city's main amusement places, is to be remodelled into a garage which will be one of the largest in the country.

L. J. Botts has opened a garage and salesroom in Red Oak, Ia., in the Stevens building, corner of Reed and Second streets.

Maurer & Miller, Freeport, Ill., has moved to 17 Stephenson street, where more room is afforded to handle the firm's line of Maxwell and Reo cars.

L. A. Dyson, conducting the Independent Auto Tire & Repair Shop at 106 East 17th street, Rock Island, Ill., has enlarged his establishment by the installation of a complete vulcanizing outfit.

The Fairmount Motors Company, Fairmount, Minn., is now occupying its new garage at Main and Second streets. The building is 110 by 52 feet, and will hold 65 cars.

The Auto Inn in Columbia City, Ind., at the corner of Van Buren and Washington streets, is now in the hands of Waterfall & Rumsyre, Ralph Widdifield having sold his interest in the firm to Adam Rumsyre.

The Chase Motor Truck Sales Company, Minneapolis, Minn., has opened a new salesroom at 1507 Hennepin avenue, in the automobile district.

The Queen City Garage, Cumberland, Md., is now in charge of W. S. Burger, who bought the interest of A. B. Cochrane. B. H. Bias is assisting Mr. Burger in conducting the business.

Robert Collins, formerly with the Motor Shop in Trenton, N. J., has opened an establishment at 210 West Hanover street, called the Hanover. A repair shop is conducted and supplies and accessories carried.

City Garage & Sales Company, is the title of a concern which will enter the garage business in San Diego, Cal., as soon as quarters can be completed. A building is being constructed at Cedar and Cordova streets.

M. Nabors and R. M. Northcutt are among the latest additions to the automobile industry in Atlanta, Ga., where they have formed a partnership and secured the agency for the Cole and Alco pleasure cars and the Alco and Federal trucks. The firm will occupy salesrooms at 239 Peach street.

Davis B. Roberts, manager of the Buick Garage in Hartford, Conn., which was partly destroyed by fire recently, announces that the building is to be replaced at once.

L. R. Pingrey and C. A. Waite, formerly partners in the West Liberty Auto Company, West Liberty, Ia., have dissolved business relations, and Pingrey will conduct the garage formerly operated jointly.

The Corona Machine & Auto Works is the name of a new repair concern which recently started business in Corona, Cal.

The Indiana Garage & Sales Company, located at 3316 East 15th street, Kansas City, Mo., has closed a contract with the Lincoln Motor Car Works, Chicago, whereby it will become distributing agent in Kansas City for the Lincoln light delivery wagons. The first shipment of cars has been received.

The Everitt Auto Sales Company, recently incorporated for $30,000 under the laws of Ohio, has opened a salesroom for the distribution of Everitt cars, made by the Everitt Motor Car Company, Detroit, formerly the Metzger Motor Car Company, throughout the State of Ohio. The officers of the company are: President, H. K. Dobson; vice president, Elmer E. McConaha; secretary and treasurer, A. F. White.

The Baldwin Smith Motor Truck Company, 115 East Second street, Wichita, Kan., has been organized for the purpose of handling commercial motor vehicles in Wichita and vicinity. The company recently closed a contract with the Lincoln Motor Car Works, Chicago, Ill., becoming distributing agent for the Lincoln light delivery wagon.

Fred Campbell, proprietor of an accessory house in St. Louis, Mo., has been elected president of the Motor Accessories Association of that city.

L. L. Law, manager of the Jackson Motor Parts Company, Toledo, O., will be distributing agent for the Jackson car, made by the Jackson Automobile Company, Jackson, Mich., in northwestern Ohio, southern Michigan and eastern Indiana.

Thogton Newsum, Memphis, Tenn., has opened a salesroom and branch office for the products of the United States Tire Company, New York City.

The Hudson-Latham Motor Company, Kansas City, Mo., has been organized to handle the Hudson line, made by the Hudson Motor Car Company, Detroit. The salesrooms will be located at 1717-19 McGee street.

Finch & Freeman, Indianapolis, Ind., has been appointed distributor for the Nyberg line, made by the Nyberg Automobile Works, Anderson, Ind., and will be located on North Capital avenue.

M. N. Norton of the Taxi Service Company, Providence, R. I., and Arthur H. Page, Waterbury, Conn., are the chief figures in the organization of a taxicab company in the latter city.

H. C. Osterman has purchased the Hogarth garage at Deadwood, S. D., and will erect a modern automobile establishment in its place. The transaction involves $15,000 and the building will cost $8000.

The Savannah Auto Repair Company, Savannah, Ga., which started in business on a small scale a few years ago, has increased its equipment from time to time, until today it has one of the finest and largest exclusive automobile repair and rebuilding plants in the South. A campaign of education among automobilists was recently conducted by the firm.

The Kansas Motor Car Company, Wichita, Kan., has filed incorporation papers and will conduct an automobile establishment at Wichita, engaging in the general distributing business. The principal stockholders are J. M. Kirkwood, well known automobile man, and E. A. Watkins, until recently president of the Citizens' State bank at Manchester, Okla. The firm expects to do a business the next year aggregating $500,000.

NEWS NOTES OF THE INDUSTRY.

(Too Late for Classification.)

Koogle Automobile Company, Indianapolis, Ind.; $10,000; to deal in automobiles, wagons, etc.; incorporators, J. G. Koogle, C. P. Cline, E. S. Buenting.

Guarantee Motor Car Company, San Antonio, Tex.; $10,000; incorporators, J. F. Hagan, H. J. Smith, C. W. Voss.

Ardery Holliday Motor Car Company, St. Joseph, Mo.; $10,000; to manufacture, sell and repair automobiles; incorporators, J. W. Ardery, J. W. Holliday, Jr., W. S. Thompson, Charles Ardery, W. H. Watson.

Harley Company, Springfield, Mass.; $50,000; garage and engineers; incorporators, Leon J. Harley, Leon J. Harley, Jr., Thomas B. Purves, Jr.

Tredvent Tire Company, New York City; $100,000; to manufacture automobile tires; incorporators, Morris Rachmil, Nathan A. Sterling, Samuel Ring.

Greenpoint Tire Repair Company, Brooklyn, N. Y.; $10,000; incorporators, Charles E. Keller, Anna Kovacs, John Kovacs, Jr.

Walter Williamson Automobile Company, Highland Park, N. J.; $10,000; to deal in automobiles and accessories; incorporators, W. M. Williamson, W. Whittlesey, V. J. Miller.

Auto Service & Supply Company; Wilmington, Del.; $15,000; incorporators, F. A. Webb, B. I. Bothe, Alfred Hindle.

New York Electric Vehicle Association, Inc., New York City; $50,000; to deal in motor vehicles; incorporators, George Tiernan, Frank H. Parcello, Robert G. Redlefsen.

A. W. Haile Motor Company, Buffalo, N. Y.; $300,000; incorporators, Arthur W. Haile, Bradley H. Phillips, E. C. Schlenker.

Park City Auto Company, Ashland, Ky.; $1000; incorporators, Howard Elhoff, B. E. Tate, J. Varnell Tate.

Viking Manufacturing Company, New York City; to deal in automobiles; $25,000; incorporators, A. R. Bangs, R. Condon, A. O. Briggs.

L-A-W Motor Truck Company, Wilmington, Del.; $200,000; incorporators, G. G. Rheubym, C. V. Mannering, C. R. Mudge.

Taxi Service Company, Waterbury, Conn.; $10,000; incorporators, Michael W. Norton, C. B. Schoenmehl, Arthur A. Page.

Cameron Manufacturing Company, Beverly, Mass.; $300,000; motor vehicles and boats; incorporators, Everett S. Cameron, Helen P. Cameron, Albion B. Emerson.

Harmon-Yount Company, New York City; $10,000; automobile business; incorporators, Daniel H. Hanckel, Frederick B. Hunt and others.

Brockway Motor Truck Company, Cortland, N. Y.; $100,000; to manufacture motor vehicles; incorporators, George A. Brockway, Charles B. Pomeroy and others.

Troy Motor Company, Troy, N. Y.; $10,000; incorporators, Richard G. Thornmeyer, H. P. Schoonmacker and others.

The Waverley Company, Indianapolis, Ind., has supplied the Fleischmann Yeast Company, New York City, with a large number of commercial vehicles, made by it, a photograph of 20 Waverley light delivery wagons being shown herewith. This is only a portion of the entire fleet operated by this concern, inasmuch as it has 12 others, ranging in capacity from one to three tons, on order or in use in Baltimore and other eastern cities. The majority of these cars have been in service for the past eight months and are said to be doing their work consistently and with a good degree of economy.

FLEISCHMANN'S
YEAST

Fleet of 20 Silent Waverley Electric Delivery Wagons in Service with the Fleischmann Yeast Company, New York City.

C. L. Morgan, sales manager of the electric division of the General Motors Truck Company, Pontiac, Mich., has resigned to become associated with the Moon-Hopkins Billing Machine Company, St. Louis, Mo., as eastern sales agent. His new headquarters will be at 350 Broadway, New York City.

Elwood Haynes, president of the Haynes Automobile Company, Kokomo, Ind., maker of Haynes cars, recently completed an overland trip throughout the East, visiting New York, Boston, and several of the more important centres in that district.

The Hupp Motor Car Company, Detroit, maker of the Hupmobile, has increased its capital stock from $500,000 to $750,000. The additional $250,000 will cover expansion, equipment and facilities to care for the production of some 15,000 cars during the coming season.

C. S. Henshaw, for a number of years connected with the E. R. Thomas Motor Car Company, Buffalo, N. Y., as branch manager, and a pioneer salesman in the industry, has resigned as manager of the New York branch, to take effect in the near future.

The B. F. Goodrich Company, Akron, O., maker of Goodrich tires, is undergoing an era of factory expansion, because of the rapid increase of its output. A new building, six stories high, is nearing completion, and work already has begun on a six-story office building, which with a two-story addition to the present quarters, will furnish much desired room.

George E. Daniels, vice president and general manager of the Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, has announced a number of factory additions, which will add about 300,000 square feet of floor space.

The Dahl Punctureless Tire Company of America has been organized in Minneapolis, Minn., to take over the business of the Dahl Punctureless Tire Company of Minnesota in the manufacture of automobile tires, etc. The home office will be located at 246-248 West 59th street, New York City, and Chicago will be made the distributing point for the Middle West.

John N. Stockfisch, formerly with the Havoline Oil Company, New York City, as division manager, has resigned to take a positon in like capacity with the Texas Oil Company of the same city, manufacturer of Texaco oils.

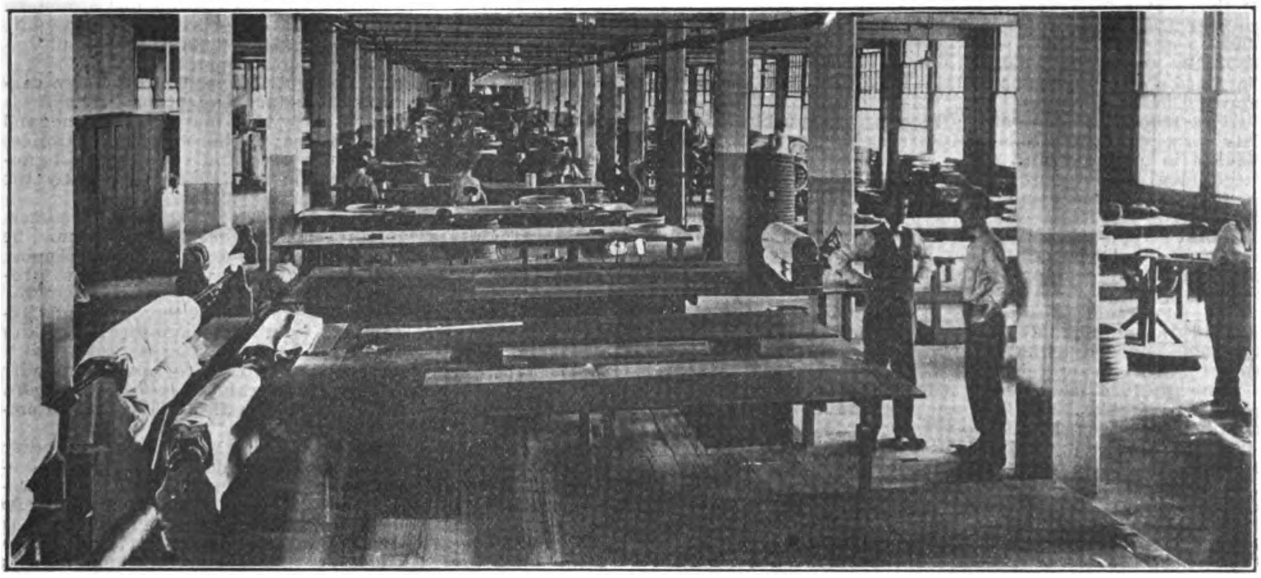
The Fisk Rubber Company, Chicopee Falls, Mass., maker of Fisk tires, recently entertained about 90 sales managers and salesmen connected with its 35 branch offices throughout the country, at the factory. Following the convention a clambake was held at Hampton ponds, Westfield, Mass., which was attended by some 150 representatives of the automobile trade.

The Goodyear Tire & Rubber Company, Akron, O., devotes a separate department in its factory to repair work, as may be indicated by the accompanying illustration. The department is in charge of competent workmen, all experts in the manufacture and care of Goodyear tires.

The Cole Motor Car Company, Indianapolis, Ind., manufacturer of the Cole cars, has appointed the following agents: Abbeville Motor Car Company, Abbeville, S. C.;

Wolverine Auto Company, Bay City, Mich.; Model Auto Company, Clinton, Ia.; Johnson Motor Company, Duluth, Minn.; Potter Burgess Motor Company, Erie, Penn.; Fred H. McCullough, Fort Wayne, Ind.; Galesburg Machine Works, Galesburg, Ill.; John Christensen & Co., Galveston, Tex.; Cowdin & Woodland, Grand Rapids, Mich.; F. H. Graf Motor Car Company, Hamilton, O.; Thomas Motor Car Company, Lima, O.; Banta Bros., Low Point, Ill.; National Garage & Sales Company, Manistee, Mich.; Jerome P. Parker-Harris Company, Memphis, Tenn.; Myersdale-Overland Company, Myersdale, Penn.; J. C. Lewis Motor Company, Oakland, Cal.; H. W. Bowen, Pawtucket, R. I.; Ottawa Garage Company, Ottawa, Ill.; Neate & McCarthy, Portland, Ore.; B. & C. Auto Company, St. Johnsville, N. Y.; Guarantee Motor Car Company, San Antonio, Tex.; J. C. Lewis Motor Company, Savannah, Ga.; Bunnell Auto Sales Company, Toledo, O.; Prince Motor Car Company, Urbana, O.; B. C. Automobile Company, Ltd., Vancouver, B. C.; Burd Auto & Supply Company, Waterloo, Ia.

The R-C-H Corporation, Detroit, maker of the R-C-H cars, has closed 1913 contracts with the following dealers: Piedmont Motor Car Company, Charlotte, N. C.; Lincoln Garage & Repair Company, Kankakee, Ill.; Henley Oversole, Newman, Ill.; F. W. Koenig, LaSalle, Ill.; Thompson & Walther, Marshall, Ind.; Menomonie Auto Company, Menomonie, Wis.; Commercial Garage, Lebanon, Penn.; Leon Morris, Demopolis, Ala.; A. Y. Harvey, Meridian, Miss.; S. G. Brannon, Columbus, Ga.; George Grow Auto Company, Boston; Remington Motor Car Company, Remington, Va.; H. M. Vondersmith, Lancaster, Penn.; **George F. Guide**, St. Cloud, Minn.; The Larimore Auto Company, Larimore, N. D.; Lewis Bros. & Johnson Mercantile Company, Rocky Ford, Col.; H. C. Shaw, Galeton, Penn.; A. E. Smith, Avondale, Col.; Montana Auto Service Company, Butte, Mont.; A. F. Anderson, Lynn Center, Ill.; P. F. Sondergroth, Mendota, Ill.; Standard Garage, Ottawa, Ill.; Indiana Auto & Supply Company, LaPorte, Ind.; James L. Robertson, Visalia, Cal.; Oslerberg & Colmark, Kensington, Minn.; Henry Cain, Monticello, Minn.; Claude O. Hallenbeck, Canandaigua, N. Y.; C. H. Beck, Webb City, Mo.; H. L. Triplett, Whittier, Cal.; M. F. Morris, Avondale, Penn.; W. E. Layman, Coshocton, O.; Timmons Auto Company, Longmont, Col.; Mogul Auto Company, Newburg, N. Y.; R. C. Jones, St. Louis, Mo.



Interior of the Room in the Goodyear Tire & Rubber Company's Factory at Akron, O., Reserved for the Repair Department.

W. Downs and S. Fales, Boston, Mass., have opened a vulcanizing shop at Waltham, Mass., and are doing business under the firm name of the Waltham Vulcanizing Company.

Walter E. Blake has made necessary changes to the Palace stables at Ansonia, Conn., and has opened a garage for storage and repair purposes.

The Oldsmobile, made by the Olds Motor Works, Lansing, Mich., is now located in its new building, 626-630 Commonwealth avenue, Boston, with salesrooms, executive offices and service station. The building is four stories high, of reinforced concrete construction.

The Buick Boston Company will soon occupy its new salesroom, completed at Massachusetts avenue and Newbury street, Boston.

The Derry Auto & Carriage Company will remove from its present quarters on West 12th street, Los Angeles, Cal., to its new and larger home on South Los Angeles street.

Peter Albers and Henry Hagedorn have rented the Manitou livery, in which to locate a garage at Luverne, Minn. The firm will be known as Albers & Hagedorn and will deal in automobile supplies and accessories, besides having the agency for the Overland cars, made by the Willys-Overland Company, Toledo, O.

Frederick Worsley has opened a garage at Perry, Kan., fitted with a complete line of automobile supplies and accessories.

The Pioneer Automobile Company has opened a branch in the new building recently erected on 24th street and Broadway, San Francisco, for the sales and service departments of its business.

The Howard Automobile Company, San Francisco, has taken the three floors and basement of a warehouse on Sutter street for a repair shop.

The Stanley Auto Company and Frank Stanley, New Castle, Ind., individually, have made a 10-year lease of the building on Broad street, from which Edward Peed recently sold out his livery stock. The company plans to conduct an increased business in its new home.

Fred Durnwald has assumed charge of the Palace garage, which he recently purchased at Freemont, O.

The Sweeney Automobile Company was recently incorporated in New Jersey. The concern will have its principal office at 208 North Broad street, Philadelphia.

The Wallace Automobile Company was recently incorporated at Wilmington, Del., and will have its principal offices at 206-210 North 21st street, Philadelphia.

John W. Hubbard has retired from the City garage, Port Chester, N. Y., and Clifford Flint has purchased his interests. Arthur B. Lowden remains in the firm as partner and with Mr. Flint hopes to carry on an excellent business.

The Overland Automobile Company, Rockford, Ill., has been incorporated for the exclusive sale of the Overland cars, made by the Willys-Overland Company, Toledo, O. A distributing branch sales department has been opened.

The Knipper Kipp Company, which recently purchased the Kondolf garage at Monroe bridge, Rochester, N. Y., has moved into new quarters and is now ready for business.

Frank Brown, Chickasha, Okla., has purchased of A. L. Eagles, the garage on South Union avenue, Los Angeles, Cal. The purchase price is said to have been $25,000.

Fred H. McCulloch of the Minuet electric garage, Fort Wayne, Ind., has taken the agency in that city for the Cole Motor Company, Indianapolis, Ind., maker of the Cole car.

Charles Noel of the firm of Noel Bros., Goshen, Ind., has sold his interests therein to James Waltz, who will soon open a new garage to be conducted under the same firm name as the old establishment.

The East End Auto Company, Grand Rapids, Mich., has received a permit to erect a one-story addition to its garage in that city.

John J. Sullivan & Co., Cincinnati, O., has let the contract for a concrete and brick public garage on Michigan avenue. The garage will represent an investment of about $7000.

Edward Junck of Dallas, Tex., has rented the Cravens building at Fort Smith, Ark., and he will soon open a garage, repair and machine shop.

J. F. Wallace of Chicago has secured plans for a one-story brick garage to cost $17,000. The building will be located on South State street, Chicago.

The Motor Car & Supply Company, recently organized at Savannah, Ga., will do a general repair business and will carry a full line of automobile supplies.

The Potomac Motor Car Company has taken quarters on H street, Washington, D. C., until the completion of its new salesroom and service department on Connecticut avenue.

W. B. Herbst, one of the pioneer automobile dealers of Indianapolis, Ind., has found it necessary, because of increasing business, to secure more commodious quarters on West Michigan street.

William G. Faats has taken possession of the building known as Brown's garage, Binghamton, N. Y., and is conducting the automobile business formerly operated by Howard Brown.

H. F. Sundin, formerly with the National Motor Vehicle Company, Indianapolis, Ind., has opened an agency and service station for the National at Kansas City, Mo.

Samuel H. Rosenthal has purchased of Harvey T. Weeks, a two-story garage on Wabash avenue, Chicago, for $60,000, giving to the Chicago Title & Trust Company a trust deed to secure $25,000 for six months.

The Rainier & Lineberger Company, general eastern distributor of the Garford Company, Elyria, O., maker of Garford trucks and pleasure vehicles, has taken a lease of the Thomas building on Boylston street, Boston. P. C. Chrysler, a motor truck man of wide experience, will be in charge. His son, G. R. Chrysler, will direct the pleasure car end of the business.

The South Brooklyn Auto Livery & Sales Company, Brooklyn, N. Y., has just opened its large garage, which has 25,000 square feet of floor space. The establishment is not only for storage purposes for commercial and pleasure cars, but for repairs, painting, upholstering and supplies, with a rental department of taxicabs, touring cars and limousines. The company is agent for the R-C-H cars, made by the R-C-H Corporation, Detroit.

William R. Baker, Milford, Mass., has leased the salesroom formerly occupied by Leroy Leighton and will act as distributor for Oakland cars, made by the Oakland Motor Car Company, Pontiac, Mich., for Worcester county, Mass.

L. B. Clark has opened a first class repair shop at Hartford, Conn., and expects later to establish a garage in connection with it.

The Essenkay Company, Chicago, has purchased the City garage, Hagerstown, Md., of W. Kieffer Hull. J. B. Neville is manager and R. L. Mowen has charge of the mechanical department.

Charles Jacobson and Thomas B. Finlay, inventors and machinists, Hartford, Conn., have leased a large building on Main street, that city, and have opened an automobile repair shop. Their equipment includes all the latest appliances, making their establishment one of the best in the city.

The Poertner Automobile Company, New York, has opened fine new quarters at 1384 Bedford avenue, Brooklyn The concern is the eastern representative of the National and Herreshoff cars.

The Stafford Illuminated Auto Lamp & Number Company, Dallas, Tex., has filed an amendment increasing its capital stock from $25,000 to $50,000.

Kirk's Garage has opened for business on Crown street, New Haven, Conn. The establishment has a capacity of 250 cars and is fitted with the latest improvements and conveniences.

J. A. Bagwell and Cline Bagwell, formerly located at Macon, Ga., have transferred their business to Savannah, Ga., where they have secured headquarters with Broughton & Lamb, garage owners. They have the agency for the Overland and Little Four cars.

The Warren Motor Car Company, Detroit, maker of the Warren pleasure cars, has made the Warren agency house at San Francisco a distribution point of parts of the Warren machines, to the entire Pacific Coast trade. The agency, in charge of Edward Knauss, will have the handling of an immense stock of Warren parts, giving it the same advantages to take care of its owners as a branch house.

John S. Waterland and Charles Andrews, Chico, Cal., are erecting a large automobile garage in that city, to cost $10,000. The structure is to be in the mission style of architecture and will be one of the most modern automobile establishments north of Sacramento.

Hurlburt Motor Truck Company, New York City; $150,000; incorporators, J. P. Carroll, W. B. Carswell, F. D. Peale.

Punctureless Tire Company, Chipley, Fla.; $12,500; directors, L. W. Crow, J. S. McGeachy, C. B. Dunn.

Indianapolis Automobile Clearing House, Indianapolis, Ind.; $50,000; to manuacture and sell automobiles; incorporators, E. J. Kane, F. E. Barrett, T. E. Byrne.

North River Garage, New York City; $20,000; incorporators, W. C. Lockwood, Leonard E. Jelly, Robert C. Shaw.

Robertson Tire & Auto Company, Birmingham, Ala.; $2000; incorporators, J. E. Vandergriff, E. R. Minhinette, Jr., W. W. Robertson.

United Motor Equipment Company, Augusta, Me.; $1,000,000; directors, president and treasurer, E. M. Leavitt; clerk, Joseph Williamson.

Engle & Vincent Automobile Company, Columbus, O.; $15,000; to deal in automobiles; incorporators, Charles H. Engle, G. A. Marquardt, Frank L. Vincent, Charles W. Engle, John K. Henry.

Marathon Tire & Rubber Company, Akron, O.; $100,000; articles made of rubber; incorporators, Ellis R. Diehm, C. C. Owens, Sterling Newell, Donald McBride, H. J. Crawford.

Automatic Emergency Brake Company, Birmingham, Ala.; $60,000; incorporators, G. R. Godwin, J. R. Heaton, H. S. Stickle.

Grafton Motor Company, Grafton, W. Va.; $5000; to repair and store automobiles, deal in and hire same; incorporators, Henry J. Pracht, H. D. Comerford, J. Howard Reynolds, A. R. Kunst, D. C. Peck.

William E. Norris, Bridgeport, Conn., proprietor of the General Motors Service & Truck Company, has leased the garage formerly occupied by the Miller Motor Car Company. While the business of the General Motors Service & Truck Company has heretofore been confined to the sale of trucks, it will now maintain a thoroughly up-to-date garage with first class equipment for the care and repair of pleasure cars and commercial vehicles of both gasoline and electric types.

Green & Sibley, proprietor of Liberty garage, has purchased of Elmer E. Bray the latter's carriage and harness business at Lynn, Mass., which he has conducted for the past 19 years. Green & Sibley will maintain the Bray business as a selling plant in connection with its garage.

The Great Falls Automobile Company, Inc., has purchased the old Montana Motor Car Company, Great Falls, Mont., and is now equipped to do all kinds of automobile repair work. The company owns the only complete vulcanizing plant in the city, in which work of retreading and remaking tubes is accomplished.

The Texas Motor Company has purchased the Lattig garage at Corpus Christi, Tex., securing a lease of five years. S. C. Smith is vice president and general manager of the company.

S. E. Pope, Jeffersonville, Vt., has just opened a modern two-story garage equipped for every kind of automobile repair work. A vulcanizing machine, paint shop and elevator are among the conveniences installed.

Robert C. Hupp and Louis G. Hupp, Detroit, have certified to a partnership to conduct and transact business at San Francisco, where they will market gasoline and electric motor vehicles and parts thereof, in addition to conducting a garage for the care and repair of automobiles of all kinds. The company will be known by the name and style of R-C-H Company.

The Rex Garage and auto repair shop, Harrisburg, Penn., capable of housing 30 machines, will in future be known as the Rex Auto Garage under new management, E. C. Hawthorn and George Wolfe being the new proprietors.

Harry Hall ,has opened a garage at Seventh and McClure streets, Freemont, O., for the storage of all types of automobiles.

A. L. Gifford, for the past two years associated with the Boston branch of the Studebaker Corporation, is now a member of the sales force of the J. S. Harrington Company, Boston.

George C. Brinkman, St. Louis, Mo., has again taken the agency for the Nyberg cars, made by the Nyberg Automobile Works, Anderson, Ind., for the state of Missouri. Mr. Brinkman had the agency last year and met with gratifying success.

The Andersch Bros. Motor Company, Minneapolis, Minn., has been formed by the famous fur men of that city to enter the automobile business as distributor for the Abbott-Detroit motor cars, made by the Abbott Motor Company, Detroit, in Minnesota, North Dakota and South Dakota.

F. E. Richardson has withdrawn from the Richardson-Neighbors Motor Company, Cleveland, O., distributor for the Cole and Hupmobile lines. He has organized the Richardson Motor Car Company and will be located in a building adjoining the old company. Mr. Richardson will handle the Cole cars exclusively and Mr. Neighbors will look after the Hupmobile interests.

F. N. Phelps and A. F. Neale, Boston, representatives of the Baker Motor Vehicle Company, Cleveland, O., maker of the Baker electric wagons, have taken new quarters at 801 Boylston street. Mr. Neale is one of the Baker company's oldest pleasure car dealers. Mr. Phelps represents the truck department of the firm in a large part of New England.

Capt. Harry G. Chase, Boston, acting chief signal officer of the Massachusetts militia, has joined the sales force of the New England branch of the White Company, Cleveland, O., manufacturer of White pleasure and commercial vehicles. Mr. Chase will devote the major part of his time to the commercial side of the business.

J. Weeder, formerly with the Packard Motor Company, Boston, is among the recent recruits to the Buick Boston Company's sales force.

The Grant Bros. Auto Company, Detroit, which for years has conducted one of the most exclusive and up-to-date garages at Detroit, has become distributor for the Lozier, made by the Lozier Motor Company, Detroit, in that district.

The R. S. Mattoon Motor Company, 2015 Michigan avenue, Chicago, an old established concern, has taken the Ohio line of cars, made by the Ohio Motor Car Company, Cincinnati, O., which it will handle exclusively.

MILLER'S ATLANTA STORE.

The business conducted by Chas. E. Miller, 97-103 Reade street, New York City, in Atlanta, Ga., has grown to such proportions that it has been found necessary to secure more commodious quarters. To this end a store in a new building, nearing completion, at the corner of Harris and Peachtree streets, has been acquired and the southern branch will be located at 259 Peachtree street in the near future. As is well known this pioneer accessory manufacturer, jobber, exporter and importer has 14 branches in 13 cities and in nine different states. The business conducted at each of these is growing rapidly, and the result in Atlanta is quite in keeping with the Miller policy.

NEW R-C-H ROADSTER ANNOUNCED.

Announcement is made of a new long wheelbase roadster by the R-C-H Corporation, Detroit, in response to a demand for a car of this type along the lines of previous models. The new car will embody the features of the touring car and will have a wheelbase of 110 inches, fitted with an English roadster body the seats of which will be much lower than the regular models and will be provided with extra deep cushions. The fuel tank is mounted on the rear deck and will contain 26 gallons, and a trunk large enough to carry two suit cases is also provided.

The equipment is very complete, including as it does five electric lights with an 100 ampere-hour capacity storage battery, non-skid tires, Warner Auto-Meter, top with Jiffy curtains and slip cover, demountable rims, horn, rear vision mirror, tools, jack, etc. In addition one extra non-skid tire is mounted on an extra demountable rim in a self-locking tire carrier located on the right running board. A slip cover is also furnished for the trunk.

The new model is especially appropriate as a business man's machine as it is easily handled and its long rear deck provides ample space for carrying sample cases, etc.

COLE EXPERTS NAMED.

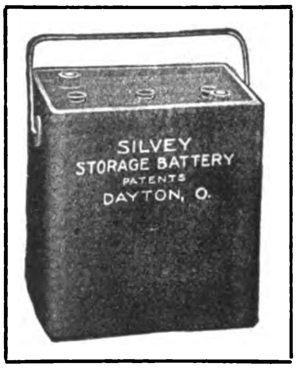
In line with the policy of the Cole Motor Car Company to maintain the highest possible service for Cole owners, four valuable additions have been made to its travelling field force, which will add much strength to the service organization. C. J. Corkhill, an automobile man of much experience, has been appointed assistant sales manager with headquarters at Omaha, Neb. His territory, over which he will have complete control, is bounded on the east by the Missisippi river, on the south by the Gulf of Mexico, on the west by the Rockies and on the north by Canada. J. R. Moler is to hold a similar position in the territory west of the Rockies, and will continually travel among the Cole agents.

J. R. Hamilton, a thorough mechanic, will be associated with Mr. Moler. W. B. Lacer, who has had considerable experience in automobile manufacturing, is also a Cole service expert. In adding these men to the field service department, President Cole of the company continues his staff of experts at the factory, whose duty will be to travel from place to place, as required.

SILVEY LAMPS AND BATTERY.

The growing tendency of motor car owners to replace the oil and acetylene lamps with electrical units has resulted in electrical concerns developing this branch of the industry. Among those who have been manufacturing and marketing lamps and batteries is the Silvey Electric Company, 10-16 Canal street, Dayton, O.

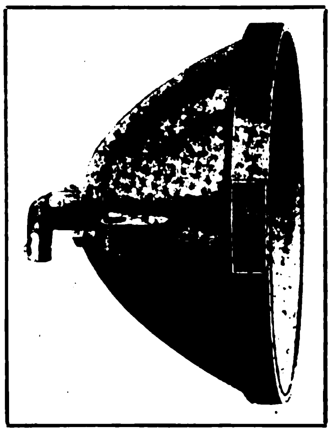
The electric searchlight presented in the accompanying illustration is a casting of pure silver, aluminum and another metal, the construction making for durability as well as extreme lightness. The body, rear stem and carrying parts are integral and the front ring is of the same material as the lamp. The true parabola mirror is highly burnished and being air tight cannot tarnish or become dirty. The lamp is made in three sizes, black enameled or polished and the front or glass holder is furnished in brass, bronze or enamel as desired, without extra charge.



Silvey Battery.

The company also manufactures a torpedo type of reflector designed for converting the gas lamp into an electrical unit. These reflectors are of spun metal, vary in sizes from five to 11 inches, and each has a flexible cord for connecting to the source of current.

The Silvey storage battery has been on the market for a number of years and is made in three sizes and amperages, these being six-volt members and their capacities are 45, 90 and 135 amperes, respectively. They are constructed on the interchangeable plan and the jars are of hard rubber with high ribs, providing ample space for the electrolyte. The vents are set in a recess so that if any electrolyte escapes it will return to the cell. The connectors are of acid proof material and marked to prevent errors in connecting. The battery is made portable by means of a steel carrying bail, attached to hard rubber bosses at each end of the jar. The bail may be detached if desired. The company also markets lamps, sockets, switches, wire, battery boxes, etc.



Silvey Electric Lamp.

TRADE DIRECTORY WITH 1,000,000 CIRCULATION.

A Record of Known and Reliable Business Houses, Revised 48 Times the Year, Contrasted with the Indiscriminate Listings of General Directories.

A trade directory is distinctly a reference. Its value to the buyer is in the accuracy of its information. Its worth to the concern listed is gauged by the care in compilation and the frequency of revision. Commercial data as ordinarily compiled is with each enterprise of record grouped under its appropriate classification. These lists are published four times a year at the most and are circulated to those who are sufficiently interested to purchase them. Naturally the distribution is limited and the expense is considerable. Aside from active manufacturing interests few are purchased. These directories are general and are not as a rule devoted to any particular industry. Neither are they confined to any special group of industries. They are not public conveniences and are serviceable only to the subscriber.

In these lists all trade interests are given like prominence. The firms that have the highest business reputation and standing are rated at parity with others that may be little known and of doubtful repute. The buyer may be brought into relations with the unreliable concern solely through the fact that he assumed reliability through its apparent equal rating with others in the industry. In this respect the trade directory is a vehicle for those who are unscrupulous to pirate upon the businesses that have been long established and are deserving of confidence and patronage.

The guide for the buyer must be dependable, first of all. It must be accurate and it must be composed of firms of unquestioned reputation. It ought to specify so far as possible to differing products of each concern. Buying at long range is becoming the more and more necessary and time is a potent factor.

The Buyers' Guide published in The Automobile Journal, the Motor Truck and the Accessory and Garage Journal specifies the firms that are actual and legitimate business competitors. The classification is select from the viewpoint of the buyer and the seller. The list is complete in every sense. It directs attention to reliable business houses and inspires confidence in them because they are well and favorably known. Both the buying and the selling interests are benefited.

The Buyers' Guide appears in each issue of these three magazines. It is revised for each edition, and there are 48 distinct publications annually, which insures to those making use of it that it is correct to the day of publication. The compilation is first brought directly to the attention of the subscribers. The magazines are then preserved for reference. The trade directory may have a circulation of 5000 each edition, and four editions annually at the most. The average business guide goes to practically the same persons each issue. The Buyers' Guide is published in The Automobile Journal and reaches its 13,000 subscribers 24 issues the year, and once each month it is received by the 9000 readers of the Motor Truck, and by the nearly 12,000 who subscribe to the Accessory and Garage Journal. This totals approximately 34,000 different interests who receive the Buyers' Guide in the magazines either 12 or 24 times a year. This is from three to six times the number of editions of the best and most progressive general directory and the distribution is about 580 per cent. more.

The value of the Buyers' Guide is alike to all who receive it. The Automobile Journal is published for the benefit of the owners of automobile vehicles. More than 90 per cent. of its circulation is to this class of readers. The Motor Truck is devoted to the promotion of the mechanical wagon for highway transportation and it is read by those who are using such service or are studying haulage subjects with a view to utilization of power conveyances. The Accessory and Garage Journal is given over to the industry producing the pleasure car and the commercial transport, to those distributing them, to those selling them, to those manufacturing equipment, accessories and supplies, to the garage and public service station owners and managers, and the repairers and those who specialize maintenance work.

The Buyers' Guide is a systematically arranged classification of select firms. It is a list of reliable and dependable concerns, known through merit of production and worthy of confidence because of established reputation. It is composed of enterprises producing practically everything that may be desired in connection with the use of the automobile. The Buyers' Guide is revised for each edition and it is more complete than any other in this respect. No less than 48 revisions each year insures the most authentic information.

The Buyers' Guide is a reference instantly at the command of those desiring its facts and specific detail. It contains the precise knowledge wanted and everything not essential is eliminated. It is complete and thorough in all requirements.

Besides the qualities emphasized the Buyers' Guide is published in the editions of Standard Automobile Mechanical Handbooks. The works are the most comprehensive of their kind and are recognized authorities. They are adopted as text books in many of the largest and best known technical and mechanical schools. They go into the hands of those who use them constantly as references. As a complete library of practical worth they are preserved and the lists are always available. The distribution of these volumes will aggregate approximately a half million the present year. This places in the hands of the purchasers of these works the latest and most desirable buying information.

The combined circulation of the Buyers' Guide in the magazines, based on the distribution of April 1, is 564,000 annually, and in the handbooks the most conservative estimate of sales is a half million the present year, so that there will be approximately a million copies distributed during 1912. There is no question as to the figures stated. There is the natural increase that is not considered in the statement made.

The service of the Buyers' Guide is free to all advertisers who have yearly contract with any one of the magazines. Each firm is listed under one or more appropriate classifications. Any new production may be designated, a condition that is especially desirable with any established firm.

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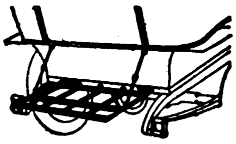

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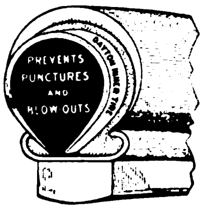

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Easily inserted and can be changed from OLD to NEW casings.

Write (Right Now) for Descriptive Catalog.

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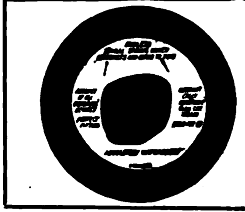
Makes Car Handling an Easy Job.
Useful in Hundreds of Ways and Always Ready. A Certain Economizer of Time and Money. Booklet "E4" for the Asking.

Canton Foundry & Machine Co., Canton, O., U. S. A.



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GIVEN ONLY BY THE
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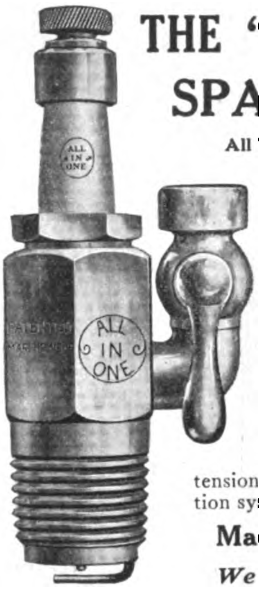
It prevents any water entering the spare tire (either from rain or hose used in washing). Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

Hopewell Brothers Newton, Mass.



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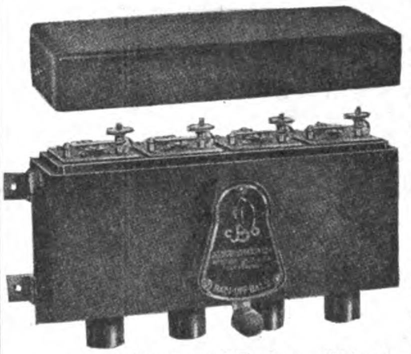

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Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York.

Miller, Chas. E., 97-103 Reade St., New York.
Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York, 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 185 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

Marburg Bros., Inc., 1786 Broadway, New York. (S. R. O.)

New Departure Mfg. Co., Bristol, Conn. (New Departure.)

R. I. V. Co., 1771 Broadway, New York. (R. I. V.)

BATTERIES.

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York.

Lincoln Electric Co., 1007 Atlantic Ave., Brooklyn, N. Y. (Hi-Po Waterproof Dry.)

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind., South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 908 Boylston St., Boston; 287 Lafayette St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Mayer Carburetor Co., 2678 Main St., Buffalo, N. Y. (Mayer.)

Sumner, George, Inc., 1841 Broadway, New York; 755 Boylston St., Boston. (Rayfield.)

CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

CARS—GASOLINE PLEASURE.

Brush Runabout Co., 3 West 61st St., New York. (Brush runabout, Liberty-Brush.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)

Croxton Motor Car Co., Washington, Penn. (Croxton.)

Cutting Motor Car Co., Jackson, Mich. (Cutting.)

Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.

Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige-Detroit.)

Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (E-M-F and Flanders.)

United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st St., New York. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Federal Motor Truck Co., Junction & Leavitt Sts., Detroit. (Federal.)

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Jarvis-Huntington Automobile Co., Huntington, W. Va. (Jarvis-Huntington.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Peerless Motor Car Co., Cleveland, (Peerless.)
Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Stewart Motor Corporation, Buffalo, N. Y. (Stewart.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st St., New York. (Sampson, Brush, Stoddard.)

V. C. Motor Truck Co., Lynn, Mass. (V. C.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

Westfield Motor Truck Co., Westfield, Mass. (Westfield.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Anderson.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

United States Motor Co., 3 West 61st St., New York. (Sampson.)

BUYERS' GUIDE---Continued

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)
White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.
Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)
Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.
Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford cone.)

COILS.

Heinze Electric Co., Lowell, Mass.
J. & B. Manufacturing Co., Pittsfield, Mass. (Type J. C.)

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CUSHIONS.

Leavens & Co., Wm., 32 Canal St., Boston. (Leavens Shock Absorber.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.
Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FORE DOORS.

F. E. Lortz & Co., 2503 E. 55th St., Cleveland.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)
National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Automobile Supply Manufacturing Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)
Dean Electric Co., Elyria, O. (Tuto.)
Randall-Faichney Co., Boston. (Jericho, Jubilee.)
Branch: 918 Eighth Ave., New York.

IGNITION DEVICES.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Master Vibrator.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)
Hartford Suspension Co., 146 Bay St., Jersey City.
Branches: 1700 Broadway, 212-214 W. 88th St., New York; 825 Columbus Ave., Boston; 1437 Vine St., Philadelphia; 1458 Michigan Ave., Chicago; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.; 803 Woodward Ave., Detroit; 448-450 No. Capital Blvd., Indianapolis.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)
Milwaukee Bronze Casting Co., 119 Clinton St., Milwaukee, Wis.
Morse, Frank W., 516 Atlantic Ave., Boston.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)
Geiszler Bros. Storage Battery Co., 514-520 W. 57th St., New York.
J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Light Regulator.)
Remy Electric Co., Anderson, Ind. (Remy.)
Sager Co., J. H., 271 South Ave., Rochester, N. Y.

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.
Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)
Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.
Hawe, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.
Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Bldg., Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.
Kellom & Co., Chas. F., 118 Arch St., Philadelphia. (Invader.)
Branch: 284 Columbus Ave., Boston.
Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.
New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia; 1486 Michigan Ave., Chicago; 1111 Superior Ave., N. W., Cleveland; 485 Turk St., San Francisco; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; Spokane, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.
New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)
Standard Oil Co., New York. (Polarine.)
Branches: In all cities.
Texas Company, The, 7 West St., New York.
Branches: Boston Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.
Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indian Pythian Bldg., Indianapolis.
Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.
Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)
Kimball Manufacturing Co., Motor Mart, Boston. (Mea.)
Marburg Bros., 1786 Broadway, New York. (Mea.)
Remy Electric Co., Anderson, Ind. (Remy.)
Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: 18-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; Mass. Ave. & St. Germain St., Boston; 480-86 Van Ness Ave., San Francisco; 868 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.; S. W. Cor. Cherry & Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; Seattle, Wash.; London, Eng.; Buenos Ayres.

MATS.

Sidwell Pedal Mat Co., 245 Columbus Ave., Boston. (Pedal.)

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Auto & Saval.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.
Emblem Manufacturing Co., Angola, N. Y. (Emblem.)
Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)
Swenson, E. A., 298 Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Hazard Motor Manufacturing Co., 789 Coates St., Rochester, N. Y. (Hazard.)
Rutenber Motor Co., Marion, Ind. (Rutenber.)

PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

PUBLICATIONS, AUTOMOBILE.

The Automobile Journal, 24 issues, $1.00 the year.
The Motor Truck (Commercial Car.) Monthly, $1.00 the year.
The Accessory and Garage Journal, Monthly, $1.00 the year.
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Lighting the Motor Car by Electricity.. .25
Sent Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

PUMPS, OIL AND GREASE.

Randall-Faichney Co., Boston. (B-Line.)
Branches: See Horns.

PUMPS, TIRE.

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)
Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.
United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demontachable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 436 South Dearborn St., Chicago.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.

Hartford Suspension Co., 146 Bay St., Jersey City. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Eliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York; 55 Boylston St., Boston. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1074 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Janney, Steinmetz & Co., Philadelphia.

Kimball Manufacturing Co., Motor Mart, Boston. (Lodge Double-Pole.)

Randall-Faichney Co., Boston. (Mac-Kae.)
Branches: See Horns.

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: See Magnetos and Magneto Supplies.

Standard Co., The, Torrington, Conn. (Black Eagle.)

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston. (Mac-Kae Universal.)
Branches: See Horns.

SPEEDOMETERS.

Hoffecker Co., The, Motor Mart, Boston. (Hoffecker.)

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1480 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Marburg Bros., Inc., 1786 Broadway, New York. (Marburg-Hagen.)

Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland.

SPROCKETS.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Carbo-Light Co., 51st and Butler Sts., Pittsburg, Penn. (Carbo-Light.)

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

Page-Lester Co., 129 W. Van Buren St., Chicago. (Tite-Wad Rubber Putty.)

Perfection Filler Co., Motor Mart, Park Sq., Boston. (Perfection.)
Factory: Somerville, Mass.

TIRES—CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park Sq., Boston; 1731 Michigan Ave., Chicago; 905 First Ave., South, Minneapolis; 1529 Cleveland Place, Denver; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco; 917 E. Pike St., Seattle; 316 North Broad St., Philadelphia; 1197 Broadway, New York; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit; 1616 Grand Ave., Kansas City.

Dayton Inner Tire & Manufacturing Co., 17 Madison St., Dayton, O. (Dayton.)

Diamond Rubber Co., Akron O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Cataract Rubber Co., Wooster, O. (Cataract.)
Branches: Boston, New York, Providence.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: New York, Philadelphia, Pittsburg, Chicago, Kansas City, Cleveland.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tires—Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS. (See Cars, Commercial.)

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Manufacturing Co., 1756 Cranston St., Providence.

TURNTABLES.

Beach Co., T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

Canton Foundry & Machine Co., Canton, O. (Universal.)

Portland Garage, Portland, Me., (Portland.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WASHING DEVICES.

Perfect Manufacturing Co., Albany, N. Y.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WIRES AND CABLES.

Diamond Rubber Co. of N. Y., Akron, O. (Diamond.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

THE ACCESSORY —AND— GARAGE JOURNAL

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VOL. II. PAWTUCKET, R. I., OCTOBER, 1912. No. 6

STOCKHOLDERS ASSESSED $24 A SHARE.

Details of Latest Plans for Reorganizing United States Motor Company Said to Meet with Favor of All Interested Parties—New Sales Manager for Grinnell Electric—Lamp Men Buy Peerless Stock—Will Make Knight Engines.

Although several plans for reorganizing the United States Motor Company, New York City, which went into the hands of receivers Sept. 11, have been published during the past month, it is understood that none of them met with unqualified indorsement by all interested parties. The latest announcement respecting the situation is that an assessment of $24 a share is to be made upon the preferred and common stock of the parent organization, and on the preferred and common stock of the Columbia Motor Car Company, Hartford, Conn., one of its subsidiaries. It is understood now that the total capitalization will be scaled down as follows:

For and in consideration of the $24 assessment, the new company will issue in exchange for the preferred certificates 24 per cent. of new first preferred, 25 per cent. of the second preferred and 30 per cent. of common. For the common certificates outstanding, on payment of an assessment of $24 a share, the new company will issue 24 per cent. of first preferred, 17.5 per cent. of second preferred and 30 per cent. of common. This assessment means that the new company will start out with a clear capital for working operations of about $3,000,000. It is proposed to raise by this method the sum of $5,720,000. The remainder will be used for funding the matured obligations.

At this time there is still remaining in the treasury of the company the sum of $1,000,000. The distribution of this fund was one of the chief matters of contention in the deliberations of the merchandise creditors. It is understood that a compromise has been reached, whereby these creditors will receive 25 per cent. of their claims in cash, 25 per cent. in first preferred, 25 per cent. in second preferred, and 15 per cent. in common, thus making a settlement of approximately 90 cents on a dollar.

All first and second preferred stock of the new company and all common stock other than shares reserved to qualify directors is to be vested for a term of not exceeding five years in Charles H. Sabin, Harry Bronner and James C. Brady, and their successors as voting trustees, and voting trust certificates in such form as may be determined by the committee will be distributed in lieu of stock. Voting trust certificates are intended to be distributed to creditors and stockholders participating in this plan substantially as follows:

First Preferred Stock.

To depositing holders of debenture bonds and bond scrip (50%)	$3,080,755
To depositing holders of claims against the Motor company only (25%)	475,906
To depositing stockholders of the Motor company and of the Columbia company duly paying the assessments hereinafter provided for:	
Preferred stockholders (24%)	2,763,152
Common stockholders (24%)	2,957,844
Total	$9,277,657

Second Preferred Stock.

To depositing holders of debenture bonds and bond scrip (50%)	$3,080,755
To depositing holders of claims against Motor company only (25%)	475,906
To depositing stockholders of the Motor company and of the Columbia company duly paying the assessments hereinafter provided for:	
Preferred stockholders (25%)	2,878,283
Common stockholders (17½%)	2,156,761
Total	$8,591,705

Common Stock.

To depositing holders of debenture bonds and bond scrip (40%)	$2,464,604
To depositing holders of claims against Motor company only (15%)	285,543
To depositing stockholders of the Motor company and of the Columbia company duly paying the assessments hereinafter provided for:	
Preferred stockholders (30%)	3,453,940
Common stockholders (30%)	3,697,305
Total	$9,901,392

In connection with this situation, it is announced that Benjamin Briscoe has resigned as president of the company, although he will remain in office until the middle of November. He retains his interest in the concern, however.

REID WITH GRINNELL ELECTRIC.

Well Known Selling Agent Becomes Sales Manager of Prominent Detroit Concern.

The many friends of Theodore C. Reid of Jackson, Mich., will be glad to learn of his appointment as manager of the sales division of the Grinnell Electric Car Company, Detroit, maker of Grinnell electric vehicles. Mr. Reid brings to his new position a wealth of information concerning modern methods of salesmanship, and as he is thoroughly convinced of the practicability of the electric car, there is little doubt that his new connection will prove as successful as his past record would seem to warrant.

For the past few years Mr. Reid has been identified with one of the most enterprising and systematic selling organizations in Chicago. His insight into selling methods was obtained through a very broad and thorough experience in several lines, and this led the Grinnell company to select him from a large number of prospective sales managers. There is every reason for believing that he will add material strength to the Grinnell organization.

T. C. Reid, Sales Manager Grinnell Electric Car Company.

BUY PEERLESS STOCK.

National Electric Lamp Men Now Powerful Factors in Affairs of the Concern.

Five of the men most influential in the National Electric Lamp Company, Cleveland, O., a branch of the General Electric Company, have purchased substantial blocks of stock,in the Peerless Motor Car Company, Cleveland, O., maker of Peerless pleasure and commercial cars. They are H. A. Tremaine, B. G. Tremaine, J. B. Crouse, J. R. Crouse and F. S. Terry and they now form a powerful factor in the affairs of the automobile manufacturing concern.

Between the corporations as such there will be no alliance, but the experience and connections of the lamp men will furnish important impetus to development of the Peerless company's business. The latter concern owns 20 acres of property in Cleveland and the ground and nine-story building on Broadway, New York City, besides its allied distributing companies in a number of states.

The concern within the year has sold $1,100,000 in 6 per cent. bonds and $300,000 in stock and is about to issue $1,100,000 additional stock, it is said, making its total stock capitalization $3,000,000. The officers are: President, L. H. Kittredge; vice president, E. H. Parkhurst; treasurer, F. I. Harding; secretary, George B. Siddall. W. H. Staring, L. H. Treadway, A. B. McNairy, Samuel Scovil and C. E. Sullivan constitute the board of directors and it is believed that representatives of the National Electric Lamp Company will shortly be elected to the board.

ATLAS ENGINE WORKS SOLD.

Lyons-Atlas Company Is Purchaser and Plant Will Resume Work on Large Scale.

The Atlas Engine Works of Indianapolis, has been purchased by the Lyons-Atlas Company, which has been incorporated with a capital stock of $500,000, all paid in. The concern will take possession of the plant, which covers 67 acres, at once and will begin the manufacture of Knight engines for the trade. The Atlas Engine Works was ordered sold by Judge Weir of the superior court and was in the hands of a receiver for 3.5 months. The Lyons-Atlas Company, which made the successful bid, is composed of experienced Chicago men who have been engaged in the manufacturing business. The president, James W. Lyons, and the vice president, William F. Lyons, were connected with the Atlas Engine Works about 20 years ago. George W. Lyons is secretary and treasurer.

Under the provisions of the bid the new company will pay $441,000, the interest on the $1,050,000 in bonds, secured by a mortgage deed of trust held by the Indiana Trust Company; $105,000, a certain indebtedness secured by $150,000 in bonds; $48,187.04, a debt which is secured by $63,000 in bills and accounts receivable, and $80,000 in cash. Two judgments against the Atlas Engine Works, aggregating $6700 will also be paid. The company will take over the real estate and buildings subject to the mortgage deed of trust, but the personal property must be paid for in cash. In addition to the manufacture of Knight engines it will continue the production of the Diesel engine and will employ from 2000 to 3000 men.

President A. V. Myer of the National Motor Supply Company, Cleveland, O., will sail Nov. 1 to look after the European business of his concern which makes the National vulcanizer.

ACCESSORY EXHIBITORS AT COMING SHOWS.

EIGHTEEN new members were elected at the recent meeting of the Motor & Accessory Manufacturers in New York City, at which time allotment of spaces for the New York, Chicago and Boston shows also was made. The new members follow:

Bijur Motor Lighting Company, New York City; Endurance Tire & Rubber Company, New York City; Edward G. Budd Manufacturing Company, Philadelphia; Brown & Sharpe Manufacturing Company, Providence, R. I.; Hartford Machine Screw Company, Hartford, Conn.; Simms Magneto Company, New York City; Ignition Starter Company, Detroit; Walpole Rubber Company, Boston, Mass.; New Jersey Car Spring & Rubber Company, Jersey City, N. J.; Hess Steel Castings Company, Bridgeton, N. J.; Schoen-Jackson Company, Medina, Penn.; Gould Storage Battery Company, New York City; New Miller Carburetor Company, Indianapolis, Ind.; Marathon Tire & Rubber Company, Cuyahoga Falls, N. Y.; Electric Auto-Lite Company, Toledo, O.; Baldwin Steel Company, New York City; Pittsburg Model Engine Company, Pittsburg, Penn.; Garage Equipment Company, Milwaukee, Wis.

The allotment of spaces shows that members will exhibit during the following weeks:

Name and address	Mfr. of	M. S. G.	G. C. P.	Chicago	Boston
Ajax-Grieb Rubber Co., New York City	Ajax tires	both	....	both	both
American Ball Bearing Co., Cleveland, O	American axles	first	....	first	....
American Bronze Co., Berwyn, Penn	Non-Gran bronzes	first	....	both	....
American Hardware Corp., New Britain, Conn	Corbin-Brown speedometer	first	first	....	....
Atwater Kent Mfg. Works, Philadelphia	Kent Unisparker	both	....	both	....
Auburn Auto Pump Co., Boston, Mass	Ten-Eyck pumps	first	....	first	first
Auto Parts Mfg. Co., Muncie, Ind	Transmission gears	....	....	both	....
Automobile Supply Mfg. Co., Brooklyn, N. Y	Newtone horn	both	....	first	both
Aurora Automatic Machine Co., Chicago	Thor motorcycle	....	first	....	....
A-Z Co., New York City	Radiators	first	....	....	....
Badger Brass Mfg. Co., Kenosha, Wis	Solar lamps	both	....	both	....
Baldwin Chain & Mfg. Co., Worcester, Mass	Baldwin chains	both	....	both	second
Batavia Rubber Co., Batavia, N. Y	Batavia tires	first	....	first	first
Bijur Motor Lighting Co., New York City	Electric generators	both	....	....	....
Borne, Scrymser Co., New York City	Colonial oil	first	....	....	both
Bosch Magneto Co., New York City	Bosch magneto	both	....	both	....
Bower Roller Bearing Co., Detroit	Bower bearings	both	....	both	....
Bowser & Co., S. F., Fort Wayne, Ind	Storage systems	both	....	both	both
Briggs Magneto Co., Elkhart, Ind	Briggs magnetos	both	....	both	....
Brown-Lipe Gear Co., Syracuse, N. Y	Gears	both	....	both	....
Buda Co., Harvey, Ill	Buda motors	both	both	both	....
Budd Mfg. Co., Edward G., Philadelphia	Steel bodies	both	....	....	....
Byrne, Kingston & Co., Kokomo, Ind	Kingston carburetor	both	....	both	....
Carnegie Steel Co., Pittsburg, Penn	Steels	both	....	....	....
Champion Ignition Co., Flint, Mich	AC Star plugs	both	....	both	both
Chase & Co., L. C., Boston, Mass	Top fabrics	first	....	....	....
Chicago Drop Forge & Fdy. Co., Chicago	Drop forgings	both	....	both	....
Coes Wrench Co., Worcester, Mass	Coes wrench	both	....	first	both
Columbia Lubricants Co. of N. Y., New York City	Monogram oil	first	....	....	first
Columbia Nut & Bolt Co., Bridgeport, Conn	Lock nuts	both	....	....	....
Connecticut Tel. & Elect. Co., Meriden, Conn	Ignition specialties	both	....	first	first
Consolidated Rubber Tire Co., New York City	Kelly-Springfield tires	both	....	both	both
Continental Caoutchouc Co., New York City	United States tires	both	....	both	both
Continental Motor Mfg. Co., Muskegon, Mich	Continental motor	....	....	both	....
Continental Rubber Works, Erie, Penn	Tires	....	first	....	....
Cook's Sons, Adam, New York City	Albany greases	both	....	first	first
Cotta Transmission Co., Rockford, Ill	Transmission gears	both	....	both	....
Cowles & Co., C., New Haven, Conn	Lamps and trimmings	first	....	first	....
Cramp & Sons Ship & Eng. Bldg. Co., Wm., Philadelphia	Brass materials	both	both	both	both
Detroit Lubricator Co., Detroit	Mechanical lubricators	....	....	both	....
Diamond Chain & Mfg. Co., Indianapolis, Ind	Diamond chains	both	....	both	....
Diamond Rubber Co., Akron, O	Diamond tires	both	....	both	both
Dixon Crucible Co., Jos., Jersey City, N. J	Dixon's graphites	both	....	both	both
Doehler Die Casting Co., Brooklyn, N. Y	Bearings and parts	first	....	first	....
Double Fabric Tire Co., Auburn, Ind	Interlock inner tires	first	....	first	first
Dover Stamping & Mfg. Co., Cambridge, Mass	Dover funnels	first	....	....	first
Dykes Co., John L. G., Chicago	Tire accessories	first	....	first	....
Edison Storage Battery Co., West Orange, N. J	Edison batteries	both	....	both	both
Edmunds & Jones Mfg. Co., Detroit	E. & J. lamps	both	....	both	....
Eisemann Magneto Co., New York City	Eisemann magneto	both	....	both	....
Electric Storage Battery Co., Philadelphia	Storage batteries	both	....	both	both
Empire Tire Co., Trenton, N. J	Empire tires	both	....	both	first
Endurance Tire & Rubber Co., New York City	Endurance tubes	first	....	first	first
Esterline Co., Lafayette, Ind	Lighting systems	first	first	both	....
Federal Rubber Mfg. Co., Cudahy, Wis	Federal tires	....	....	first	first
Findeisen & Kropf Mfg. Co., Chicago	Rayfield carburetor	both	....	both	....
Firestone Tire & Rubber Co., Akron, O	Firestone tires	both	....	both	both
Fisk Rubber Co., Chicopee Falls, Mass	Fisk tires	both	....	both	both
G & J Tire Co., Akron, O	United States tires	both	....	both	both
Gabriel Horn Mfg. Co., Cleveland, O	Signalling devices	both	....	both	....
Garage Equipment Mfg. Co., Milwaukee, Wis	Gemco equipment	both	....	both	....
Gemmer Mfg. Co., Detroit	Steering gears	both	....	both	....
Globe Machine & Stamp. Co., Cleveland, O	Metal boxes	both	....	both	....
Goodrich Co., B. F., Akron, O	Goodrich tires	both	....	both	both
Goodyear Tire & Rubber Co., Akron, O	Goodyear tires	both	....	both	both
Gould Storage Battery Co., New York City	Storage batteries	....	both	both	....
Gray & Davis, Amesbury, Mass	Gray & Davis dynamos	both	both	both	both
Harris Oil Co., A. W., Providence, R. I	Harris oils	both	....	both	both
Hartford Machine Screw Co., Hartford, Conn	Bull Dog plugs	first	....	....	....
Hartford Rubber Works Co., Hartford, Conn	United States tires	both	....	both	both
Hartford Suspension Co., Jersey City, N. J	Tr.-Hartford sh. absorbers	both	both	both	both
Havoline Oil Co., New York City	Havoline oils	both	....	both	first
Haws, George A., New York City	Panhard oils	first	....	first	first
Hayes Mfg. Co., Detroit	Metal bodies	first	....	first	....

Name and address	Mfr. of	M. S. G.	G. C. P.	Chicago	Boston
Heinze Electric Co., Lowell, Mass	Heinze magnetos	both	....	both	both
Herz & Co., New York City	Minimax pumps	....	first	both	....
Hess-Bright Mfg. Co., Philadelphia	Hess-Bright bearings	both	....	....	....
Hess Spring & Axle Co., Carthage, O	Hess axles	first	....	first	....
Hess Steel Castings Co., Bridgeton, N. J	Steel castings	both	....	....	....
Hoffecker Co., Boston, Mass	Hoffecker speedometers	first	....	first	first
Hyatt Roller Bearing Co., Newark, N. J	Hyatt bearings	both	....	both	....
Ignition Starter Co., Detroit	Disco starter	first	....	first	....
Imperial Brass Mfg. Co., Chicago	Pumps, etc.	....	....	both	....
International Acheson Graphite Co., Niagara Falls, N. Y	Oildag, Gredag	first	....	first	first
Janney, Steinmetz & Co., Philadelphia	Seamless tanks	both	....	....	....
Johnson & Co., Isaac G., New York City	Steel castings	both	....	both	....
Jones & Co., Phineas, Newark, N. J	Automobile wheels	both	....	....	....
Kellogg Mfg. Co., Rochester, N. Y	Kellogg tire pumps	first	....	first	....
Kokomo Electric Co., Kokomo, Ind	Kingston magnetos	both	....	both	....
Leather Tire Goods Co., Niagara Falls, N. Y	Woodworth treads	first	....	first	first
Lee Tire & Rubber Co., Conshohocken, Penn	Tires and horns	first	....	first	first
Lefever Arms Co., Syracuse, N. Y	Truck transmissions	both	....	both	....
Light Mfg. & Fdy. Co., Pottstown, Penn	Aluminum castings	both	....	....	....
Link-Belt Co., Philadelphia	Maximum chains	both	....	both	....
Lovell-McConnell Mfg. Co., Newark, N. J	Klaxon horns	first	....	....	first
Manufacturers Foundry Co., Waterbury, Conn	Cylinder castings	both	....	....	....
Marathon Tire & Rubber Co., Cuyahoga Falls, N. Y	Tires	first	....	....	....
McCord Mfg. Co., Detroit	McCord radiators	both	....	both	....
Mezger, C. A., New York City	Windshields, plugs	first	....	....	....
Michelin Tire Co., Milltown, N. J	Michelin tires	both	....	first	first
Morgan & Wright, Detroit	United States tires	both	....	both	both
Mosler & Co., A. R., Mt. Vernon, N. Y	Spit Fire plugs	both	....	....	....
Motsinger Device Mfg. Co., Pendleton, Ind	Motsinger Auto-Sparker	both	....	both	....
Motz Tire & Rubber Co., Akron, O	Motz tires	both	....	both	both
Muncie Gear Works, Muncie, Ind	Transmissions, etc.	both	both	both	both
National Coil Co., Lansing, Mich	Magnetos, coils	first	....	both	first
National Tube Co., Pittsburg, Penn	Steel tubing	both	....	both	both
New Departure Mfg. Co., Bristol, Conn	New Departure bearings	both	first	....	both
New Jersey Car Spring & Rubber Co., Jersey City, N. J	Caprinco tires	first	....	first	first
New Miller Carburetor Co., Indianapolis, Ind	Miller carburetors	both	....	both	....
N. Y. & N. J. Lubricant Co., New York City	Non-Fluid oils	both	....	both	first
Noera Mfg. Co., Waterbury, Conn	Noera pumps	first	....	....	....
Oliver Mfg. Co., Chicago	Peerless jacks	both	....	both	....
Pantasote Co., New York City	Artificial leather	first	....	first	first
Pennsylvania Rubber Co., Jeannette, Penn	Pennsylvania tires	both	....	both	both
Piel Co., J., Long Island City, N. Y	Long horns	first	....	first	first
Pittsburg Model Engine Co., Pittsburg, Penn	Motors, transmissions	both	....	....	....
Racine Rubber Co., Racine, Wis	Tires	....	....	first	....
Randall-Faichney Co., Boston, Mass	Jericho horns	first	....	first	first
Remy Electric Co., Anderson, Ind	Remy magnetos	both	....	both	....
Republic Rubber Co., Youngstown, O	Republic tires	both	....	both	first
Rose Mfg. Co., Philadelphia	License brackets	both	....	....	....
Ross Gear & Tool Co., Lafayette, Ind	Ross steering gears	both	both	both	....
Rutenber Motor Co., Marion, Ind	Rutenber motors	....	....	both	....
Royal Equipment Co., Bridgeport, Conn	Duplex brakes, Raybestos	both	....	both	....
Sager Co., J. H., Rochester, N. Y	Peerless shock absorbers	first	....	first	....
Schoen-Jackson Co., Media, Penn	Feps carburetors	first	first	first	first
Schrader's Son, Inc., A., New York City	Tire gauges	both	both	....	....
Schwartz Wheel Co., Philadelphia	Automobile wheels	both	....	....	....
Seamless Rubber Co., New Haven, Conn	Rubber sundries	first	....	first	first
Shaler Co., C. A., Waupun, Wis	Shaler vulcanizers	first	....	first	first
Sheldon Axle Co., Wilkesbarre, Penn	Sheldon axles	both	....	both	....
Simms Magneto Co., New York City	Simms magnetos	first	both	first	first
Smith Co., A. O., Milwaukee, Wis	Automobile frames	both	....	both	....
Spacke Machine Co., F. W., Indianapolis, Ind	Air compressors	....	first	....	....
Sparks-Withington Co., Jackson, Mich	Fans and boxes	first	....	first	....
Spicer Mfg. Co., Plainfield, N. J	Universal joints	both	....	both	....
Splitdorf Electrical Co., Newark, N. J	Splitdorf magnetos	both	....	both	first
Springfield Metal Body Co., Springfield, Mass	Automobile bodies	first	....	....	....
Standard Roller Bearing Co., Philadelphia	Ball and roller bearings	both	....	both	....
Standard Thermometer Co., Boston, Mass	Standard speedometers	first	first	first	first
Standard Welding Co., Cleveland, O	Stanweld rims	both	....	both	both
Stewart & Clarke Mfg. Co., Chicago	Stewart speedometers	both	....	both	both
Stromberg Motor Devices Co., Chicago	Stromberg carburetors	both	....	both	first
Stutz Auto Parts Co., Indianapolis, Ind	Stutz rear system	both	....	both	....
Swinehart Tire & Rubber Co., Akron, O	Swinehart tires	both	....	both	both
Texas Co., New York City	Texaco oils	both	both	both	both
Timken-Detroit Axle Co., Detroit	Timken axles	both	both	both	....
Timken Roller Bearing Co., Canton, O	Timken roller bearings	both	both	both	....
Turner Brass Works, Sycamore, Ill	Brass specialties	both	....	both	....
United Rim Co., Akron, O	Demountable rims	both	....	both	both
United States Tire Co., New York City	United States tires	both	....	both	both
Universal Tire Protector Co., Angola, Ind	Universal treads	....	....	first	....
U. S. Light & Heating Co., New York City	Lighting systems	both	....	both	both
Vacuum Oil Co., Rochester, N. Y	Vacuum Mobiloils	both	....	both	both
Valentine & Co., New York City	Varnishes	both	....	first	first
Veeder Mfg. Co., Hartford, Conn	Veeder recorders	both	....	both	both
Vesta Accumulator Co., Chicago, Ill	Storage batteries	both	both	both	....
Voorhees Rubber Mfg. Co., Jersey City, N. J	Ideal inner tubes	first	....	first	both
Walpole Rubber Co., Boston, Mass	Walpole tires	first	....	....	....
Warner Gear Co., Muncie, Ind	Warner gears	both	both	both	....
Warner Instrument Co., Beloit, Wis	Warner Auto-Meters	....	both	both	both
Warner Mfg. Co., Toledo, O	Unit power plants	both	first	both	....
Waukesha Motor Co., Waukesha, Wis	Waukesha motors	....	....	both	....
Weed Chain Tire Grip Co., New York City	Weed tire chains	both	....	both	first
Western Tool & Forge Co., Brackenridge, Penn	Drop forgings	first	....	....	....
Weston-Mott Co., Flint, Mich	Weston-Mott axles	both	....	both	....
Wheeler & Schebler, Indianapolis, Ind	Schebler carburetors	both	both	both	....
White & Bagley Co., Worcester, Mass	Oilzum oils	first	....	first	first
Whitney Mfg. Co., Hartford, Conn	Whitney chains	both	....	both	second
Willard Storage Battery Co., Cleveland, O	LBA batteries	both	....	both	both
Williams Co., J. H., Brooklyn, N. Y	Williams wrenches	both	....	both	....
Wolverine Lubricants Co., New York City	Wolf's Head oils	both	....	both	both
Young, O. W., Newark, N. J	Tire repair outfits	both	....	....	....

TWO BUILDINGS FOR MONTREAL.

Demand for Exhibition Space Much Larger Than for Any Previous Canadian Show.

There has been such an unprecedented demand for space at the Montreal motor show, the representative automobile exhibition of eastern Canada, that the management has been obliged to secure a second building for overflow exhibitors. The 65th Armouries has been engaged in addition to the large Drill Hall on Craig street. The show will be held Jan. 4-11, under the direction of the Automobile Club of Canada.

The exhibition will be devoted to pleasure cars and motor trucks exclusively and American vehicles will probably comprise 50 per cent. of the exhibits, the balance being made up by cars of Canadian and European manufacture.

EXHIBITORS AT CHICAGO.

Space Allotted to Eighty-Two Concerns for February Display, with Electrics Unplaced.

Manufacturers who will exhibit at the Chicago show of pleasure and commercial vehicles in February have drawn positions. Eighty-two motor car concerns have received allotments and three-quarters of the centre space of the First Regiment Armory has been reserved for electric vehicles, which have not drawn. As usual, the show will be held in the Coliseum, Coliseum annex, and the First Regiment Armory. On the main floor of the Coliseum are to be 39 exhibitors; Coliseum annex, 8; Coliseum annex basement, 17; Armory, 18. The following makes will be represented:

PLEASURE CARS.

Coliseum Centre—Peerless, Flanders, Pierce-Arrow, Haynes, Glide, Buick, Cadillac, Maxwell, Stevens-Duryea, Stearns. Winton, Stoddard-Dayton, National, Hudson, Packard, Premier, Reo, Franklin, Locomobile, Studebaker, Oldsmobile, Pope-Hartford, Chalmers, Overland.

Coliseum, Along the Walls—Selden, Columbia, Auburn, Rambler, Fiat, Marmon, Alco, White, Cole, Case, Imperial, Mitchell, Moon, Oakland, Lozier.

Coliseum Annex—American, KisselKar, Cartercar. Knox, Velie, Inter-State, Hupmobile, Garford.

Coliseum Annex Basement—Colby, Paterson, Halladay, Lexington, Cino, Midland, Ohio, Crow, McIntyre, Davis, Elkhart, Mercer.

First Regiment Armory—Jackson, Austin, Matheson, Abbott, Michigan, Regal, Cutting, Kline-Kar, Pathfinder, Staver, Pullman, K-R-I-T, Westcott, McFarlan, Great Western, Stutz, Speedwell.

COMMERCIAL VEHICLES.

Coliseum Centre—Buffalo electric, Jeffery, Studebaker, Reo, Selden, Autocar, Waverley, Adams, KisselKar, Speedwell, International, Gramm, Pope-Hartford, Locomobile, Pierce-Arrow, Velie, Buick, Peerless, Federal, Hupmobile, Kelly.

Coliseum, Along the Walls—Sternberg, Durable Dayton, Alco, Walker, U. S. Motor Truck, Garford, Rapid, Reliance, Knox, Krebs, Old Reliable, Clark, McIntyre.

Coliseum Annex—Universal, Service, Bowling Green, Standard, Transit, Dart, M. & P. electric, Lippard-Stewart.

First Regiment Armory—Chicago Pneumatic, International Harvester, National, Sanford, Commerce, Four-Wheel Drive, Gramm-Bernstein, Poyer, Bessemer, Harwood-Barley, G. V., Avery, Packard, White, Sampson, A. L. Smith, Lauth-Juergens.

REMOVES TO DETROIT.

Well Known Manufacturer's Agent Transfers Boston Headquarters to Industry's Centre.

Smalley Daniels, operating as manufacturer's sales representative with headquarters in Boston for several years, has removed his main office to Detroit. He already has branch offices in five principal centres throughout the country, and the former Boston quarters will become a branch.

The operations conducted by Mr. Daniels outside of the state of Michigan are entirely distinct from the Smalley Daniels Company of Michigan, which has just succeeded the Snyder & Harbridge Selling Company of Detroit. Associated with him in Michigan is J. C. Schmadebeck, who has been connected with H. M. Snyder in the above company for a number of years.

HENDERSON SUCCEEDS CARTER.

Head of Cole Sales Force Retires to Become President of Henderson Company.

When it became known last May that the Henderson Motor Sales Company, which had been in charge of the distribution of the product of the Cole Motor Car Company, Indianapolis, since the organization of that concern, was to be absorbed by the Cole company and that the men connected with the old sales organization were to form the new Henderson Motor Car Company, R. P. Henderson became sales manager of the Cole Motor Car Company. At the same time he was financially interested in the production of the new Henderson car, and it does not come as a complete surprise to the industry that he has now resigned from the Cole company to become president of the new Henderson concern.

The Henderson Brothers of Indianapolis: C. P. at the Left and R. P. at the Right.

Mr. Henderson succeeds L. Carter, a Georgian banker, who always has been closely associated with the Hendersons, of whom there are two brothers, R. P. and C. P., and who now becomes chairman of the board of directors. In addition to being interested in the Henderson company, Mr. Carter also is one of the largest stockholders in the Cole company.

Under the new arrangement every share of stock in the Henderson Motor Car Company is owned by those actively directing its progress. R. P. Henderson continues as vice president and general manager, and L. S. French is secretary. The Henderson brothers are known in the trade as the Hendersons of Indianapolis, and R. P. will devote his time exclusively to directing the manufacturing end, while C. P. will supervise the sales and control the administration of the company's affairs.

HALL WINS PROMOTION.

Work in Illinois Leads to Appointment as Sales Manager of Olds Motor Works.

J. V. Hall, formerly manager of the Oldsmobile Company of Illinois, has been appointed general sales manager of the Olds Motor Works, Lansing, Mich., maker of the Oldsmobile, by General Manager O. C. Hutchinson. Mr. Hall's ability in his Illinois territory was marked and was responsible for his selection by Mr. Hutchinson to succeed Rupert E. Paris, resigned.

The success of Mr. Hall in his new position is assured, as the qualifications displayed by him in bringing about the efficient organization of the company in Illinois are such as indicate that he is capable of extending Oldsmobile sales in a satisfactory manner.

SHOW SPACE ALLOTTED.

Eighty-Seven Manufacturers Will Exhibit Products in Two Buildings at New York City.

Allotment of floor space for the annual pleasure car show which is to be held Jan. 11-18 in the Grand Central Palace and Madison Square Garden, New York City, running simultaneously for two weeks, has been made at the headquarters of the Automobile Board of Trade. It was evident that the interest of the manufacturers has not abated as the applications for space greatly exceeded all expectations, there being 87 requests from car makers and more than 400 from accessory producers. The figures indicate that the double show will surpass any previous exhibition ever held.

When the drawings for space were held at the quarterly meeting of the Automobile Board of Trade, a representative of each of the 61 members in the organization was present. Pleasure cars are to be shown during the first week of the exhibition and commercial vehicles will be on display in both buildings during the second week. The plan is to charge one admission, which will provide admittance to both buildings. The exhibitors of pleasure cars to make display in the Palace and Garden include the following:

Willys-Overland Company, Toledo, O., Overland.
Pierce-Arrow Motor Car Company, Buffalo, N. Y., Pierce-Arrow.
Garford Company, Elyria, O., Garford.
Knox Automobile Company, Springfield, Mass., Knox.
Moon Motor Car Company, St. Louis, Mo., Moon.
Matheson Automobile Company, Wilkesbarre, Penn., Matheson.
National Motor Vehicle Company, Indianapolis, Ind., National.
Velie Motor Vehicle Company, Moline, Ill., Velie.
Cole Motor Car Company, Indianapolis, Ind., Cole.
Kissel Motor Car Company, Hartford, Wis., KisselKar.
Studebaker Corporation, Detroit, Mich., Studebaker.
K-R-I-T Motor Car Company, Detroit, Mich., K-R-I-T.
Cutting Automobile Company, Jackson, Mich., Cutting.
Paige-Detroit Motor Car Company, Detroit, Paige-Detroit.
Motor Car Manufacturing Company, Indianapolis, Ind., Pathfinder.
Flanders Manufacturing Company, Pontiac, Mich., Flanders electric.
Fiat Automobile Company, New York City, Fiat.
Hupp Motor Car Company, Detroit, Hupmobile.
Ideal Motor Car Company, Indianapolis, Ind., Stutz.
Olds Motor Works, Lansing, Mich., Oldsmobile.
R-C-H Corporation, Detroit, Mich., R-C-H.
Lozier Motor Company, Detroit, Mich., Lozier.
Flanders Motor Car Company, Detroit, Mich., Flanders.
Oakland Motor Car Company, Pontiac, Mich., Oakland.
Pope Manufacturing Company, Hartford, Conn., Pope-Hartford.
F. B. Stearns Company, Cleveland, O., Stearns.
Dayton Motor Car Company, Dayton, O., Stoddard-Dayton.
Franklin Automobile Company, Syracuse, N. Y., Franklin.
Stevens-Duryea Company, Chicopee Falls, Mass., Stevens-Duryea.
Peerless Motor Car Company, Cleveland, O., Peerless.
Locomobile Company of America, Bridgeport, Conn., Locomobile.
Cadillac Motor Car Company, Detroit, Mich., Cadillac.
Buick Motor Company, Flint, Mich., Buick.
Mitchell-Lewis Motor Company, Racine, Wis., Mitchell.
Winton Motor Carriage Company, Cleveland, O., Winton.
Packard Motor Car Company, Detroit, Mich., Packard.
Hudson Motor Car Company, Detroit, Mich., Hudson.
Maxwell-Briscoe Motor Company, Tarrytown, N. Y., Maxwell.
Chalmers Motor Company, Detroit, Mich., Chalmers.
Cartercar Company, Pontiac, Mich., Cartercar.
Reo Motor Car Company, Lansing, Mich., Reo.
White Company, Cleveland, O., White.
Warren Motor Car Company, Detroit, Mich., Warren.
Nordyke & Marmon Company, Indianapolis, Ind., Marmon.
Columbia Motor Car Company, Hartord, Conn., Columbia.
Moline Automobile Company, East Moline, Ill., Moline.
Thomas Motor Car Company, Buffalo, N. Y., Thomas.
Premier Motor Manufacturing Company, Indianapolis, Ind., Premier.
Pullman Motor Car Company, York, Penn., Pullman.
American Locomotive Company, Providence, R. I., Alco.
Jackson Automobile Company, Jackson, Mich., Jackson.
Mercer Automobile Company, Trenton, N. J., Mercer.
Auburn Automobile Company, Auburn, Ind., Auburn.
Haynes Automobile Company, Kokomo, Ind., Haynes.
James Cunningham Son & Co., Rochester, N. Y., Cunningham.
Imperial Automobile Company, Jackson, Mich., Imperial.
Inter-State Automobile Company, Muncie, Ind., Inter-State.
J. I. Case Threshing Machine Company, Racine, Wis., Case.
Herreshoff Motor Company, Detroit, Mich., Herreshoff.
Speedwell Motor Car Company, Dayton, O., Speedwell.
S. G. V. Company, Reading, Penn., S. G. V.
Selden Motor Vehicle Company, Rochester, N. Y., Selden.
Austin Automobile Company, Grand Rapids, Mich., Austin.
Regal Motor Car Company, Detroit, Mich., Regal.
Buffalo Electric Vehicle Company, Buffalo, N. Y., Buffalo electric.
Columbus Buggy Company, Columbus, O., Firestone-Columbus.
Metz Company, Waltham, Mass., Metz.
Kline Motor Car Corporation, York, Penn., Kline-Kar.
Henderson Motor Car Company, Indianapolis, Ind., Henderson.
Louis J. Bergdoll Motor Company, Philadelphia, Penn., Bergdoll.
American Motors Company, Indianapolis, Ind., American.
Thomas B. Jeffery Company, Kenoska, Wis., Rambler.
Crow Motor Car Company, Elkhart, Ind., Crow.
Atlas Motor Car Company, Springfield, Mass., Atlas.
George W. Davis Carriage Company, Richmond, Ind., Davis.
Havers Motor Car Company, Port Huron, Mich., Havers.
Marathon Motor Works, Nashville, Tenn., Marathon.
Westcott Motor Car Company, Richmond, Ind., Westcott.
Michigan Motor Car Company, Kalamazoo, Mich., Michigan.
Benz Auto Import Company, New York City, Benz.
Marion Motor Car Company, Indianapolis, Ind., Marion.
Edwards Motor Car Company, Long Island City, N. Y., Edwards.
Lenox Motor Company, Boston, Mass., Lenox.
Ohio Motor Car Company, Cincinnati, O., Ohio.

NEW ACCESSORY MAKER.

Concern Organized in Indianapolis for Production of Tops, Seat Covers, Etc.

Frank L. Glover has been elected president and general manager of the Glover Equipment Company, Indianapolis, which has been incorporated under the laws of Indiana with a capital stock of $20,000. The concern will manufacture automobile tops, seat covers and similar goods. Temporary quarters have been secured at 142 West Market street, Indianapolis.

Mr. Glover was formerly identified with the R. J. Irwin Company and the Gates Manufacturing Company of Indianapolis and has a wide experience in the automobile accessory business. The other officers of the new company are: Vice President, Leonard Geiger; treasurer, William Umphrey; secretary, Louis Libking.

WILL DEAL IN USED CARS.

Boston Men Unite to Handle Machines Taken in Trade by Reputable Agents.

A new organization to handle high grade used cars has been formed at Boston and is known as the Massachusetts Auto Clearance House, with headquarters in the old Boston Cab Company's building at 108-110 Massachusetts avenue. George W. Tolman, for some time in charge of the used car department of the Whitten-Gilmore Company, and Edward H. Houtz, who was manager of the used car department of the Thomas Motor Car Company, will direct the affairs of the new company.

Both men have in their long experience become experts in their particular line and will endeavor to make their concern all that its name implies, a clearing house for used cars taken in trade by a number of reputable dealers.

NEW COLE SALES POLICY.

Country Divided and Placed in Charge of Experienced Men as Sales Managers.

President J. J. Cole of the Cole Motor Car Company, Indianapolis, Ind., maker of the Cole cars, has devised a system of conducting the sales department of the company so that he anticipates it will give the greatest possible efficiency. The country has been divided into territories with district sales managers in charge of certain allotted districts. The plan is to give Cole agents and owners stimulated co-operation by the sales managers keeping in direct personal touch with them. The sales force thus created will work in harmony with President Cole and his sales force at Indianapolis.

J. R. Moler has been allotted the territory west of the Rockies and in the Dominion of Canada. He has for 18 years been connected with the promotion of sales and agency work. C. J. Corkhill, a pioneer automobile man, who entered the field with the Olds Motor Works and more recently was with the Apperson company in Nebraska, takes the district bounded by the Mississippi river on the east and the Rockies on the west. George H. Strout, a graduate from the bicycle business, formerly sales manager for the Columbus electric, and later sales manager for the Apperson, is given jurisdiction over the Southwest and part of the Middle West; E. C. Frady, head of the Cole Motor Company of Chicago, takes the North Central states, while William L. Colt, president of the Colt-Stratton Company, Boston, Cole eastern distributor, takes charge of a territory east of a line drawn north from Washington, D. C., to Syracuse, N. Y.

OPENS NEW FIELD.

Detroit Concern Will Produce Chassis for Those Who Desire to Fit Bodies Thereto.

The Detroit Motor Chassis Company, Detroit, has been organized with capital stock of $25,000 to manufacture complete chassis for carriage builders and other concerns which desire to supply bodies and equipment to market complete cars under their own names. The company claims to have discovered an insistent demand for this class of work. A plant has been secured at 960 Champlain street, Detroit, and deliveries are expected to begin about Nov. 1.

The officers are all men who have been identified with the motor industry for several years and are as follows: President, A. J. Kinucan, formerly connected with several Detroit automobile factories; vice president, M. C. Dewitt of the Jeffery-Dewitt Company; secretary, L. J. Stringer, formerly with the Hudson Motor Car Company; treasurer, William P. Culver of the Culver-Taylor Chain Company.

MACK IN LANSDEN COMPANY.

Heads Executive Board, Confirming Rumor of His Connection with That Concern.

J. M. Mack of Allentown, Penn., has been elected chairman of the executive board of the Lansden Company, Newark, N. J., maker of electric trucks. At the time of the reorganization of the company about a year ago it was reported that Mr. Mack, who was then vice president of the International Motors Company, New York City, maker of Mack, Saurer and Hewitt trucks, had acquired an interest, but the report could not be confirmed.

Mr. Mack has since retired from the International corporation and now is devoting himself chiefly to the new Webb company, which will manufacture motor fire apparatus at Allentown. His election as chairman of the Lansden executive board is said to relieve R. S. Hotz, president of the company, who resides in Chicago.

PROMOTION FOR WILLMAN.

Succeeds Wilson as Sales Manager for Warren Motor Car Company at Detroit.

G. L. Willman has been appointed to the office of sales manager of the Warren Motor Car Company, Detroit, maker of the Warren cars, to succeed George D. Wilson, who has become the eastern representative of the Warren company, with headquarters at New York. Mr. Willman, although a comparatively young man, possesses a varied experience.

He is a graduate of Harvard University, an expert in technical telephony, has been an instructor in salesmanship, is a fluent writer and has been an irregular contributor to several national magazines. He was connected with the Detroit Chamber of Commerce during the time that Lucius E. Wilson, vice president and general manager of the Warren company, was secretary of that organization. His many friends will be glad to learn of his promotion.

WARD BUYS KING BUSINESS.

Bid of $40,000 Accepted and He Will Continue Manufacturing Plant in Detroit.

The assets of the King Motor Car Company, Detroit, have been purchased by Artemas Ward of the advertising firm of Ward & Gow, New York City, who intends to continue the factory indefinitely. Mr. Ward's bid of $40,000 was accepted by the United States district court receiver, the Union Trust Company of Detroit.

Mr. Ward was the heaviest creditor of the company, having loaned it $100,000 in cash and also having an unsettled advertising claim against the concern amounting to about $29,000. It was found that in order to continue the manufacturing as he contemplated, material, parts and money to a large amount would be needed. The accessory men who had appealed to the courts did not care to follow this plan and left the field clear for Mr. Ward to acquire the plant.

JOINS PACKARD COMPANY.

Frank H. Trego Will Take Charge of Research Engineering Department in Detroit.

Frank H. Trego, who was until recently chief engineer of the E. R. Thomas Motor Car Company, Buffalo, N. Y., maker of Thomas pleasure cars, has returned to Detroit to take charge of the department of research engineering for the Packard Motor Car Company, manufacturer of the Packard machines. Mr. Trego is widely known in automobile circles through his connection with the technical side of the American Automobile Association's contests, having drawn up the original contest rules for 1910 and officiated at international races.

He has played an important part in the development of numerous improvements in motor construction. As one of the organizers of the Chicago Motor Club he was for two years its secretary. He was also one of the six founders of the Wolverine Automobile Club, Detroit. Mr. Trego was formerly one of the managers of the technical department of the Hudson Motor Car Company, Detroit, manufacturer of Hudson cars, and for a number of years he has been an extensive contributor to technical journals.

THOMAS OFFICIALS RESIGN.

Announcement Follows That of Placing the Concern in the Hands of a Receiver.

Judge Hazel of the federal court in Buffalo, N. Y., appointed George C. Finley and Adolph Redabow, receivers for the E. R. Thomas Motor Car Company of that city, Aug. 29. Following this action, announcement was made of the resignation of President Humpage, Vice President Gleason and Treasurer Ramsey, to take effect Sept. 1.

The stock exchange firm of Eugene Meyer, Jr., & Co., New York City, took hold of the E. R. Thomas Motor Company in February, 1911, and the concern was reorganized. According to information filed with the court, it appears that the company now has assets of $1,700,000 and liabilities of $960,000. A short time ago, it was announced that a substantial portion of the stock had been purchased by those connected with the United States Motor Company. It is understood that the receivers will continue the production of Thomas cars.

GOODYEAR SUCCESS RAPID.

Factory to Operate Day and Night to Fill Orders.

C. W. Seiberling, vice president of the Goodyear Tire & Rubber Company, states that it will be necessary to keep the Goodyear factory in operation 24 hours a day the entire year, except for two weeks in October to overhaul machinery and make repairs. This activity is necessary to meet demand for Goodyear no-rim-cut tires. The growth of the company's business the past 12 months has been phenomenal. "In all," says Mr. Seiberling, "the company has now 67 branches, 11 of which are in Canada, 55 in the United States and one in Mexico, with a new field being opened in England, Australia, South Africa and European countries.

Commenting upon the increased business of the Goodyear company, he intimates that during the past year it has been found necessary to extend its distribution system, and from September, 1911, to September, 1912, direct factory branches have been opened at Albany, N. Y.; Dayton, O.; Kansas City, Mo.; Denver, Col.; Newark, N. J.; Oakland, Cal.; Omaha, Neb.; Portland, Me.; Rochester, N. Y.; St. Paul, Minn.; Spokane, Wash.; Salt Lake City, Utah; Syracuse, N. Y.; Worcester, Mass., and Mexico City, making a total of 16 new branches in the past 12 months. New Goodyear buildings have been erected the past year at Grand Rapids, Wis.; New York City; Baltimore, Md.; Buffalo, N. Y.; Columbus, O.; Birmingham, Ala.; Kansas City, Mo.; Louisville, Ky.; Minneapolis, Minn.; Memphis, Tenn.; Newark, N. J., and Philadelphia.

AMES COMPANY REORGANIZED.

New Men Become Interested in Kentucky Corporation.

The Ames Motor Car Company, Owensboro, Ky., has been reorganized with capital of $100,000. Among the new men interested in the concern are George W. Yeoman of Muskegon, Mich., formerly sales manager of the Continental Motor Manufacturing Company, and H. M. Robins of the same city, formerly of the American Electric Fuse Company. The other stockholders include F. A. Ames and Charles T. Smith, both of Owensboro.

CADILLAC TO INCREASE OUTPUT.

Next Season's Production Will Eclipse All Past Records.

According to E. C. Howard, sales manager of the Cadillac Motor Car Company, Detroit, the 1913 season will eclipse all the company's past records for number of machines manufactured. The record for 1912 was 12,000 and this figure will be exceeded by 3000 and every one of the 15,000 cars has been contracted for by dealers. Features of the new model include a larger motor, combined electric lighting, cranking and ignition system, and many notable refinements contributing to the comfort of the passengers.

FRANK BRISCOE RESIGNS.

United States Motor's Vice President to Study Abroad.

Announcement is made that Frank Briscoe, one of the vice presidents of the United States Motor Company, New York City, has resigned. He will sail for Europe later in the month, his object being to study motor car engineering abroad. He contemplates remaining in England and on the Continent about a year. Mr. Briscoe will continue as president of the Briscoe Manufacturing Company, Detroit, one of the subsidiaries of the United States Motor Company.

HUPMOBILE WINS FIRST PRIZE.

American Car Honored at International Motor Exposition.

At the recent first international motor exposition held at Turin, Italy, at which were represented a great portion of the world's most famous motor cars, ranging in price from $500 to $10,000, the Hupmobile runabout, made by the Hupp Motor Car Company, Detroit, won first prize for automobiles of less than 110 cubic inches displacement. In this contest all points of the car were taken into consideration, even to the examination of the general efficiency of all bolts, their strength against road shocks, spring resiliency, maximum amount of weight, hardness of metals used in the different parts, etc. After this severe test, the Hupmobile stood perfect and was given first prize, a beautiful hand-worked gold medal.

NEW CAPITAL FOR ATLAS.

Springfield, Mass., Concern to Issue Additional Stock.

According to information from Springfield, Mass., the Atlas Motor Car Company of that city anticipates that business men of Springfield, New York City and Dayton, O., are to subscribe $100,000 additional stock, and the concern is to increase its capital to $250,000. The plan is said to include an issue of $100,000 in preferred stock and $50,000 in common. The company has been handicapped somewhat of late because of its inability to secure Knight engines from the maker, and active operations are said to have been held in abeyance until fall, at which time it is expected that the new proposition will be carried out.

STRONG GOES TO INDIANAPOLIS.

Buick Motor Company to Have New Branch Manager.

E. T. Strong, new manager of the Indianapolis branch of the Buick Motor Company, succeeding R. H. Losey, recently resigned, has assumed full charge of his new positon. For the past few weeks he has been in charge of the branches in Indianapolis and Buffalo, N. Y., he having been manager of the latter before being transferred to Indianapolis. Mr. Strong has been one of the main factors in the Buick organization for several years and his promotion to the Indianapolis field is in line with the company's policy to advance the men whose work has been found to be the most meritorious.

ANNUAL IMPORTERS' SALON.

New York Automobile Show Season to Be Inaugurated at Hotel Astor.

Following the custom of several years past, the 1913 American automobile show season will be inaugurated by the annual Importers' Salon in the Hotel Astor, New York City, Jan. 2-11. With one or two exceptions all of the foreign makes represented in this country will participate in this season's Salon. Among those which will be displayed by Paris exhibitors are: De

Dion-Bouton, Isotta-Fraschini, Lancia, Mercedes, Metallurgique, Minerva, Panhard and Renault. This list represents five nations: France, Germany, England, Italy and Belgium.

HANDLEY REORGANIZES COMPANY.

Head of Marion Car Concern Completes Executive Staff.

Announcement was made at Indianapolis recently by President J. I. Handley of the Marion Motor Car Company of the completion of his new organization. Under his direction an executive staff composed of men of national prominence in the automobile industry has been secured and they have reorganized the Marion Company.

The list of men who will work with Mr. Handley in carrying out the new and extensive policies he has inaugurated includes J. B. Myers, vice president, in charge of production; J. M. Edsall, treasurer; F. G. W. Sudrow, sales manager; M. B. Morgan, chief engineer; W. McK. White, advertising manager.

MORGAN OUT OF COMPANY.

Well Known Automobile Man Severs Connection with Truck Interests.

Ralph L. Morgan, formerly with the Morgan Motor Truck Company, Worcester, which has just been incorporated for $300,000, has severed his connection with the company. He has taken a suite of offices in the People's Saving Bank building on Main street, where he will in future be at home to his friends in the automobile trade.

CARROLL, GOODYEAR MANAGER.

Promotions in Order in Rubber Business on Pacific Coast.

Frank E. Carroll, for many years prominent in automobile trade circles on the Pacific Coast, has been appointed manager of the new branch of the Goodyear Tire & Rubber Company at San Francisco. W. T. Powell of the Portland, Ore., branch, has been promoted to be Pacific Coast manager of the Goodyear Company.

MAYOR FAVORS INDUSTRY.

Boston's Executive Advises Co-Operation with Motor Car Builders.

Mayor Fitzgerald of Boston has called the attention of the Boston chamber of commerce to the advisability of co-operating with manufacturers of motor cars who are seeking locations in the East, especially the makers having a large export trade. The mayor advocates that the chamber of commerce take special efforts to attract makers to the Hub, holding that they would be of great benefit to the city. The letter is the result of a published interview with John M. Willys, president of the Willys-Overland Company, Toledo, O., in which the official pointed out the shipping advantages of eastern cities.

TRADE INFORMATION EXCHANGE

BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding.

CAR AGENCIES DESIRED.

2015—Connecticut Concern desires the agency for pleasure cars listing at $900 to $1500.

2017—Indiana Garage, under new management, with well established business, would like the agency for pleasure cars selling at $700 to $2000 and commercial vehicles at $500 to $1500.

2020—A Rhode Island Firm, with well established trade, desires the agency for pleasure vehicles listing at $1000 to $4000.

2021—New Jersey Dealer, with new garage, would take the agency for pleasure cars selling at $800 to $2000.

2119—New Jersey House, recently incorporated, would represent pleasure and commercial vehicles listing at $500 to $3000.

2246—Kansas Company, recently changed hands, wants the agency for a good pleasure car selling at $600 to $1200.

3198—California Motor Car Company, about to occupy new and larger quarters, desires the agency for automobiles listing at $1250 to $3150.

2064—New York State Garage, seeks information for agency of pleasure cars selling up to $2000 and commercial wagons up to $1500.

2065—New York State Firm, recently incorporated, would like the agency of pleasure vehicles selling at $500 to $2000; and power wagons up to $2000.

2132—New Jersey Concern is seeking information of pleasure cars selling at $500 to $1500 and commercial machines at $1000 to $1500.

2811—Ohio Company, enlarging its plant in thriving city, wants agency for commercial cars selling at $1200 to $4500.

5319—Pennsylvania Selling Firm, already handling one line, would take the agency for pleasure cars selling at $1000 to $6000.

6036—Missouri Company, establishing new salesrooms to care for increasing business, wants the agency for cars selling at $1700 to $2850.

6040—West Virginia Corporation is in the field for agencies for pleasure cars listing at $500 to $2500 and commercial vehicles at $500 to $3000.

6244—Minnesota Dealer would like to hear from manufacturers having pleasure cars selling at $650 to $2000.

4112—California Garage Company, occupying new quarters in large city, wants agency for commercial cars selling at $750 to $1500.

6226—Wisconsin Supply Company, reorganized, desires agencies for pleasure cars listed at $750 to $3000, and commercial wagons at $1000 to $3000.

2477—Kansas Garage in good location, would like the agency for pleasure cars selling at $800 to $2500.

2478—Minnesota Dealer, carrying full line of goods in vehicle and accessory lines, has room for additional agencies for pleasure cars selling at $850 to $1250, and commercial vehicles at $675 to $1200.

6264—Iowa Garage wants agency for pleasure cars listing at $900 to $2500.

2332—Pennsylvania Concern, building extensive additions to its plant, with idea of building truck bodies, is in the field for an agency of pleasure cars selling at $1000 to $3000, and commercial wagons at $1500 to $4000.

2271—Connecticut Garage, in large city, and centrally located, would take agency for pleasure vehicles listed at $1200 to $2250.

ACCESSORY AGENCIES.

2108—West Virginia Garage, recently incorporated, will take agency for pleasure and commercial automobile supplies and accessories.

2100—Minnesota Concern, making additions to its plant, will take agencies for all kinds of automobile accessories.

2112—California Garage, installed in new quarters, desires the agency for a line of accessories.

2114—Wisconsin Auto and Supply House is seeking the agency for automobile accessories and specialties, also pleasure and commercial car supplies.

2115—Kansas Company, in progressive territory, would like a complete line of automobile supplies.

2116—Minnesota Automobile Company is seeking the agency for a line of accessories which is new to the market.

2217—Iowa Concern, extending its business, desires the agency for a complete line of automobile accessories.

2218—Pennsylvania Firm, erecting two large buildings for garage, storage and repair shop business, desires full information relative to all kinds of automobile accessories for pleasure and commercial vehicles.

2320—Connecticut Concern, having central location in live city, would take agency for automobile accessories and supplies.

3221—Indiana Garage, soon to open new establishment, is interested in handling pleasure and commercial accessories and supplies.

3310—Rhode Island Dealer, building two-story addition, would like an agency for automobile equipment and accessories.

3224—New Jersey Garage, with a new establishment erected to accommodate growing business, is seeking an agency for accessories of every description for commercial and pleasure cars.

3225—New Jersey Concern, recently incorporated, will take county agency for meritorious automobile accessories of all kinds.

3226—Pennsylvania Firm, doing high class business on large scale, desires information of all kinds of accessories pertaining to motor trucks, fire apparatus, etc.

3227—California Company, having leased new and larger garage, desires agency for pleasure and commercial accessories, pleasure car supplies and equipment.

4282—New York State Dealer will take agency for all kinds of automobile equipment, accessories and supplies.

4284—New York State Corporation, recently formed, desires agency for automobile accessories and supplies.

2130—New Jersey Company, incorporated recently, would like to market a good general line of automobile accessories and supplies.

2132—Ohio House desires to take the agency for the complete equipment and parts for commercial vehicles.

5112—Pennsylvania Concern, reorganized and under new management, is extending business and desires a line of automobile accessories and supplies.

5115—Texas Firm desires accessories and supplies generally for pleasure cars.

5117—Ohio Garage, recently opened, wishes to secure agency for good line of automobile accessories, equipment and supplies.

4006—New York State Supply House is interested in securing a line of automobile supplies.

EQUIPMENT NEEDED.

1143—Connecticut Garage, recently opened in good location, desires to get in touch with manufacturers of modern garage equipment.

1144—Indiana Firm, opening a new garage, desires complete garage equipment, including machine tools and repair shop equipment and supplies.

1145—Rhode Island Garage is seeking a complete garage equipment for two floors, including complete repair shop machinery and supplies.

1146—New Jersey Concern, which has just completed a modern garage, is in the market for all kinds of garage, repair shop and automobile supplies and equipment.

1247—New Jersey Garage, recently incorporated, desires complete modern garage and repair shop equipment, including machine tools, etc.

1248—Kansas Garage, under new management, is in the market for underground gasoline tanks.

1249—California Concern, erecting new garage and salesroom, including a thoroughly modern machine shop, employing 30 to 40 mechanics, is in the market for garage supplies.

1250—Long Island Automobile Company is seeking information relative to all kinds of garage and repair shop equipment and supplies.

2156—New York State Firm, recently incorporated, is interested in garage and repair shop equipment and supplies, machine tools, etc.

2152—Recently Incorporated New Jersey Concern is in the market for general garage equipment and supplies.

2153—Ohio Garage, extending its plant, would welcome information relating to complete commercial car equipment and general garage and machine shop supplies.

1041—Pennsylvania Concern, recently reorganized, wants garage and machine shop equipment and supplies.

1043—Ohio Service Company, recently moved into larger quarters, desires information about garage and repair shop equipment and supplies.

2157—Pennsylvania Firm, recently organized, is interested in garage and repair shop supplies and equipment, including machine tools.

2158—Ohio Company, extending its business, seeks information of all garage and repair shop equipment and supplies.

1157—New Hampshire Garage, recently changed hands, is in the market for power air pump.

1163—West Virginia Concern, recently incorporated, is interested in all supplies pertaining to the operation of a modern garage and repair shop.

1165—Minnesota Automobile Company, building an addition to plant to be used as machine and repair shop, is in the market for only first class garage and repair shop equipment.

1272—Wisconsin Concern, reorganized, wants garage and machine shop equipment.

1167—Kansas Garage, recently taken under new management, needs complete repair shop equipment.

1168—Minnesota Garage, now in new and modern quarters, desires catalogues of automobile and garage supplies.

1170—Iowa Company, located in new garage, wants information of all kinds of automobile equipment and supplies.

1171—Pennsylvania Concern, erecting two buildings, is in the market for all kinds of first class garage and machine shop supplies and equipment.

1172—Connecticut Garage Company, which recently changed ownership, is interested in garage and repair shop equipment, supplies, etc.

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None.

WILLIAM H. BLACK.

Sworn to and filed with Postmaster October 1, 1912.

ROSCOE M. DEXTER.
Notary Public,

My commission expires June 30, 1914.

REGISTRATION AND RECIPROCITY.

Fifteen out of 35 states which have passed motoring laws covering the subject, permit full reciprocity to non-residents. Some of the commonwealths, the residents of which strongly advised New Jersey to repeal its obnoxious clause against visiting motorists, while nominally in the reciprocity column, really grant no reciprocity, insofar as residents on border states are concerned.

Special reference may be had to Massachusetts, which grants an exemption for 10 days in one calendar year. The same thing may be held to apply to New Hampshire and Pennsylvania, and in a similar measure to Rhode Island. This exemption is of benefit to the tourist, but even North Carolina, which requires all non-residents to register, makes an exception of those who are crossing the state.

The original idea appears to have been that of compelling residents of border states to contribute their proportionate share for the maintenance of roads which they helped to destroy. It may be remembered that this was the argument advanced by New Jersey for not granting reciprocity in any form. The special reference to Massachusetts is made because merchants in Springfield, Pittsfield, North Adams, Fitchburg, Haverhill, Newburyport and other cities near the border have found that residents of Connecticut, Rhode Island, New Hampshire, Vermont and New York fail to visit their stores as regularly as they might be expected, for fear of being arrested or compelled to take out a special automobile license. Naturally, a movement is on foot looking toward an amendment in the law, permitting full reciprocity, such as is granted by Connecticut, Vermont and New York.

An accompanying table sets forth the exemption granted to non-resident motorists in the several states, and it also presents the registration provisions. For instance, the registration in Alabama expires annually on Oct. 1, and the fee is $7.50 to $20, according to the horsepower. This table, as well as others which have appeared in these columns from time to time, shows the desirability of uniform laws covering these matters.

	Expires	Fee	Exemption
Alabama	Oct. 1	$7.50-20	reciprocity
Arkansas	Dec. 31	$5	reciprocity
California	perpetual	$2	temporarily
Connecticut	Dec. 31	50c hp.	reciprocity
Delaware	Dec. 31	$5	reciprocity
Florida	perpetual	$2	30 days
Georgia	perpetual	$2	30 days
Illinois	Dec. 31	$4-10	60 days
Indiana	perpetual	$1	reciprocity
Iowa	Jan. 1	*40c hp.	reciprocity
Kentucky	annually	$5-20	reciprocity
Maine	Dec. 31	$5-15	30 days
Maryland	Jan. 1	$5-25	†§14 days
Massachusetts	Dec. 31	$5-25	10 days
Michigan	Dec. 31	$3	reciprocity
Minnesota	triennially	$1.50	30 days
Mississippi	annually	$5-25	30 days
Missouri	Jan. 31	$2-10	20 days
New Hampshire	Dec. 31	$10-40	10 days
New Jersey	Dec. 31	$3-10	15 days
New Mexico	Sept. 30	$11	60 days
New York	Jan. 31	$5-25	reciprocity
North Carolina	July 1	$5	‡
North Dakota	Jan. 1	$2	temporarily
Ohio	Jan. 1	$5	reciprocity
Oregon	Dec. 31	$5-10	30 days
Pennsylania	Dec. 31	$5-15	10 days
Rhode Island	annually	$5-25	20 days
South Dakota	perpetual	$1	reciprocity
Utah	perpetual	$2	temporarily
Vermont	Dec. 31	$1 hp.	reciprocity
Virginia	Jan. 1	$5-20	†14 days
Washington	June 1	$2	reciprocity
West Virginia	perpetual	$1	reciprocity
Wisconsin	Dec. 31	$5	reciprocity

*Less than 20 horsepower, $8; †two periods of seven days each; §reciprocity with certain states by governor's proclamation; ‡only cars passing through the state are exempt.

Mechanical Pointers for Garagemen and Repairmen

THE HANDY TAPE.

An operator whose car was fitted with a pinned steering wheel was annoyed by the pin working loose and jamming while on the road. Not having the necessary tools to pein the part over and not wishing to damage the metal of the wheel, he effected a temporary repair by winding the troublesome member with friction tape. This prevented the pin from working in either direction.

REPAIRING BROKEN SPRING PADS.

Spring pads or seats rarely break, but when they do to effect a repair by the usual method of welding, it is necessary to remove the axle, springs, etc., a considerable job. At Fig. 1 is illustrated a method which can be utilized by simply jacking up the side of the car high enough to permit the removal of the spring from its seat.

At A is shown an I section axle, the front spring pad of which was broken in a collision. The damaged member was removed and the axle smoothed off, as shown at C. A seat, forged to the shape outlined at B, was fitted over this. A hole was then drilled through both members and a bolt used to hold them firmly, as depicted at D. The spring and clips were replaced and the latter tightened in the usual manner.

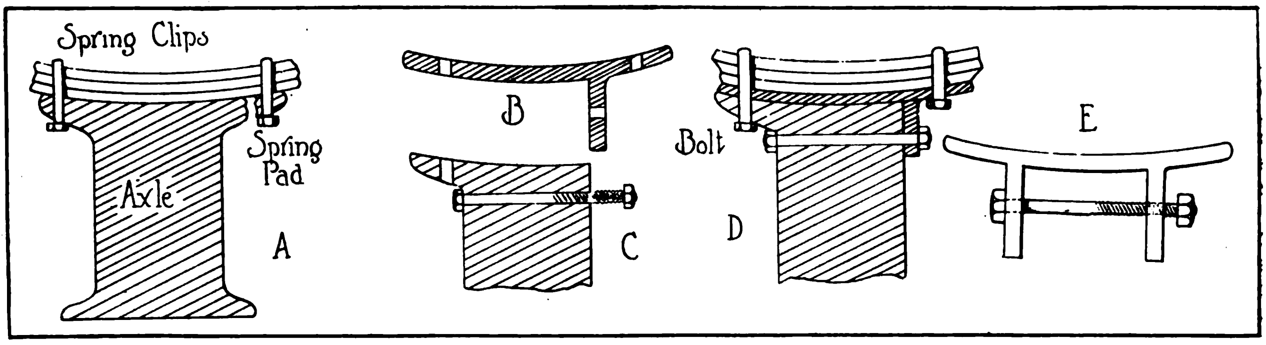


Fig. 1—Repairing Broken Spring Pads: A, Showing Broken Section of Axle; B, Forged Part, Which Is Fitted and Bolted as Outlined at C; D, Parts Re-assembled; E, Repair Applied to a Dead Axle.

The repair was effective and gave no trouble.

Broken members on rear axles of the dead type can be remedied by using the spring seat at E. The method of application is the same as before. This would not be possible, however, except on those utilizing the side chain drive.

COMMUTATOR HINTS.

It is seldom that a car is held up on the road through commutator troubles as this device will give warning in an erratic running engine, and the well posted driver will heed the notice and overhaul the timer before venturing out again. It is rare that the tension spring of the roller breaks, but when such is the case a repair can be made by bending a new hook. To do this it is necessary to remove the part. Care should be taken to mark the position of the roller and this can be done with a lead pencil on the fibre. Sometimes the timer is worn badly and the engine skips. This condition may be improved by increasing the tension of the spring. If the latter cannot be repaired a stout elastic band can be utilized temporarily.

AUTOMATIC VALVE HINT.

Motors fitted with automatic intake valves depend upon the suction of the piston to open these. Where the piston is cracked or broken serious difficulty in carburetion is experienced. A motorist, whose car was equipped with a two-cylinder engine of this type, was unfortunate in having the stem break and drop into the combustion chamber where the up-stroke drove it through the top of the piston, the combustion chamber walls being thicker and well ribbed. The owner spent many unpleasant minutes in cranking and while he could start the engine it would stall when he let in the clutch.

Finally he disconnected the intake manifold and placed a piece of cardboard between it and the cylinder thus preventing vapor from passing to the latter. The spark plug and intake valve cage were removed from the damaged member, the motor cranked and the journey resumed.

RESTORING DEAD DRY CELLS.

There are several methods of reviving dead dry cells so as to enable a stranded automobilist to reach home. The writer cannot vouch for the practicability of the following suggestion, but the tip was given by an agent for a battery concern: The depolarizer is compacted or driven downward, using a piece of wood in the operation. It is said that amperage will be increased considerably by this action. Another suggestion is the addition of a small quantity of weak acid, as for instance, vinegar.

HOME MADE RATCHET DRILL.

A motorist who planned several alterations to his car, necessitating considerable drilling of fairly large sized holes, devised a ratchet drill, a sketch of which is presented at Fig. 2. This was practically home made, inexpensive and did the work required in an efficient manner.

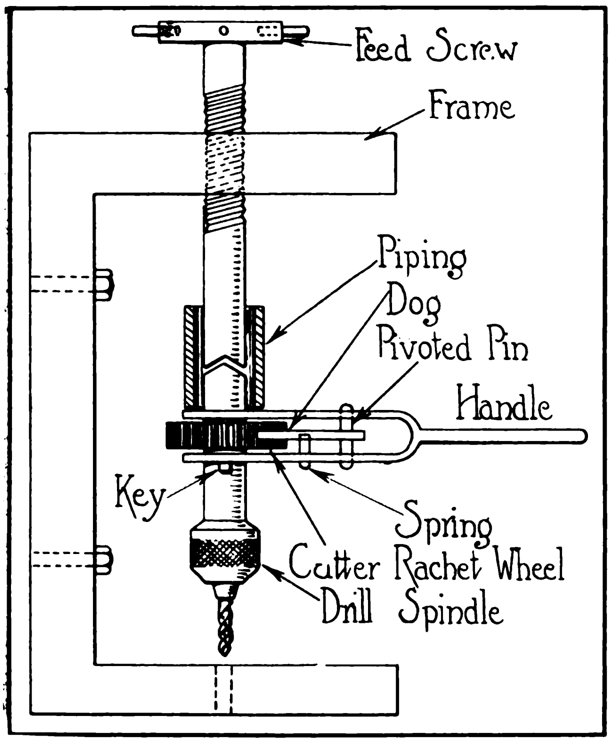


Fig. 2—Home Made and Easily Constructed Ratchet Drill.

The frame was made at a blacksmith shop, the shape being shown in the illustration, and this was bored to take two large coach screws which were utilized to fasten the metal to the wall. An old milling cutter was annealed for the ratchet and keyed on the drill spindle. A piece of strap iron was next bent U shaped and one end drilled and tapped to take the handle.

A dog was fitted with pivoted pin and controlled by a spring one end of which was secured. The feed screw member was made of round stock, threaded to pass through the frame, and the lower end recessed to fit the top of drill spindle. A piece of piping was utilized, as indicated, to prevent any possible slipping. The arrangement of the hand feed is obvious. As the ratchet is moved clockwise the tension of the drill is tightened by the feed screw which is turning in the same direction.

The device could be improved by welding a Y to the lower part of the frame which not only would strengthen the member but permit the easy handling of large pieces of work. The tool should be superior to the breast drill and save considerable time and labor.

GEAR CHANGING TROUBLES AND CAUSES.

Some drivers experience more or less trouble in changing gears and the writer knows more than one instance in which owners of cars fitted with the sliding gear transmission replaced them with the simpler planetary type because of inability to operate the former successfully. Undoubtedly there is a lack of skill in this respect, evidence of it being noted every day. It is safe to assert, however, that in the majority of machines this may be effected with little if any noise, but to accomplish this it is necessary that the operator have a knowledge of what occurs within the gearbox as well as without. There are some automobiles in which the inertia of the flywheel is not overcome, making gear changing difficult, but these can be handled easily by means of a braking device which can be fitted to either the cone or multiple disc type of clutch.

Many are able to shift from low to high without trouble but are bothered in changing down. Before discussing the subject, however, a study of the diagram, Fig. 3 is suggested. Here are presented the components of a three-speed gearbox, the clutch engaged in the flywheel, and the coupling shaft. With the motor running, the following conditions exist: First, the clutch and intermediate shaft are revolving at the same speed as the engine, while the secondary shaft and its attached gears are rotating in accordance with the ratio of the constant mesh gearing. Second, the main shaft and its gears are stationary.

Under these conditions a noise will follow if the lever be moved for an engagement of the low speed immediately upon the clutch pedal being depressed, owing to the former revolving when pressed against the stationary pinion. To bring about silent meshing both gears must be stationary, and this will not take place until the clutch, intermediate shaft and secondary member have stopped turning. This occurs a few seconds after the clutch has been thrown out fully, and then the first speed may be engaged without trouble. Instead of waiting for these conditions, however, many drivers jam the gear lever into its first speed position simultaneously with throwing out the clutch, thereby causing a grinding of the teeth and sometimes jumping the car. To determine the minimum pause in any given instance should not be a difficult matter.

Some operators will take exceptions to the above statement, saying that if they allow the clutch to come to a stop they cannot engage the first speed. This is true in some instances and is brought about by the faces of the gears being worn badly; that is, the chamfered edges have so deteriorated that unless the members come to rest with the teeth to be meshed exactly in line, the pressure of one against the other has little if any effect. The purpose of the chamfer is to facilitate meshing.

Sometimes difficulty is experienced in changing from neutral to the first speed even when a pause is made before using the lever and when the clutch pedal has been fully depressed. This is due usually to abnormal pressure being brought to bear upon the pedal, so that when a clutch stop is in position the shafts are practically locked. Even with the edges of pinions in perfect condition under such circumstances a shift cannot be made.

If difficulty be experienced, less energy expended upon the pedal probably will eliminate the trouble, but if not it may be taken for granted that the teeth are worn, as described. However, engagement may be effected by letting the clutch in a little way, thus imparting motion to the clutch shaft which in turn will move the constant mesh gears and rotate the secondary shaft, permitting the meshing of the pinion in question.

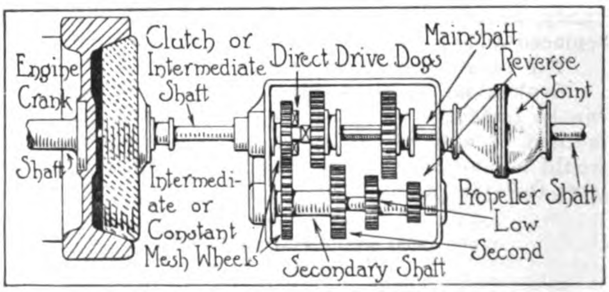


Fig. 3—Components of Three-Speed Gearbox.

In changing from first to second, the following conditions exist before the movement: First, motor, clutch shaft, and secondary member with its gears running at a comparatively high number of revolutions a minute. Second, the main shaft is turning slowly. The difference between the ratios of these two speeds requires that either the motion of the main shaft shall be increased or that of secondary reduced. The former cannot be accelerated because it is connected with the driving wheels, therefore the speed of the secondary must be cut down.

Some drivers bring this about by crowding the second speed gears against each other immediately upon disengaging the clutch. Noise results as well as considerable wear. The suggestion regarding the first change should be followed; that is, the clutch pedal should be depressed to its fullest extent and the lever moved slowly but firmly from first to second. It should be understood that the slowing of the clutch shaft cannot begin until the low speed gears are out of mesh, consequently the period during which the clutch brake is enabled to effect its purpose is very short, and if it be inefficient or none is provided, it is well to make a distinct pause when the lever is in neutral.

In making any upward change which requires the crossing of the gate this pause is automatically brought about by the time occupied in the lateral movement of the lever, but where a backward or forward movement only is made, there should be a delay and the habit cultivated. It need be very small, and on some cars would amount to no more than a slight hesitancy in the operation.

In shifting from indirect gears to the direct drive, where the latter is by dog clutches, a little more energy is required in the handling of the lever, although the conditions before and during the change are the same as in any other upward movement. This is due to the square shape of the dogs, their number and small engaging surface, as compared with gears. A pair of the former rotating at very slightly divergent speeds—conditions under which a pair of chamfered pinions would almost engage of their own accord, or, at least with no more pressure on the lever than that of a finger—will sometimes move away from one another unless the lever be held firmly. Where they have moved apart and before the operator has brought them together for engagement, the relative speeds may have changed so that the faster may have become the slower, and it will be necessary to let the clutch in again and speed up the clutch shaft before the dogs can be meshed.

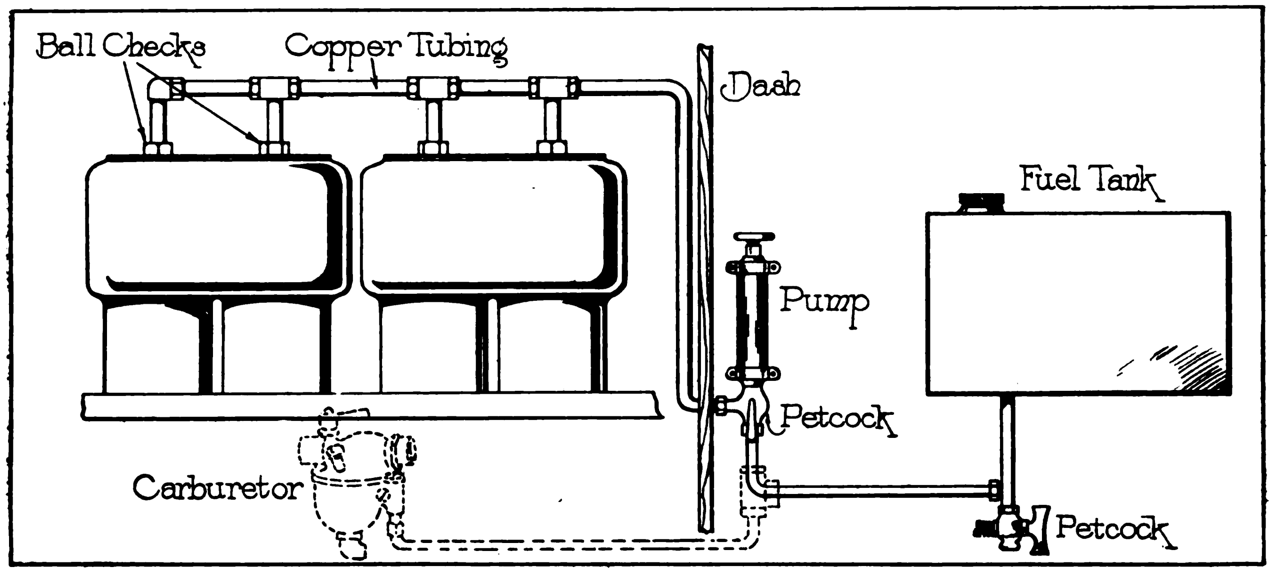


Fig. 4—Showing How a Priming Device Operated by a Hand Pump May Be Installed in the Fuel System of a Motor Car.

It may be said as a general rule having but few exceptions, that in changing up, the greater the difference in the ratio of any two gears the slower should be the movement of the lever or the longer the pause between the two positions. Some owners complain that their cars are noisy only when changing from first to second. This is due to the fact that the ratios of these gears are usually the most divergent.

PRIMING MOTOR FROM SEAT.

When motors have been exposed to the cold for any length of time some are difficult to start. They will not respond to repeated crankings even though the carburetor be flooded and the air intake closed. This state of affairs may exist even with a strong spark, at the points of the igniting member. The usual method is to raise the hood, open the priming cocks, and inject gasoline.

This operation involves unstrapping the hood and raising it, opening the tool box and securing the priming can. Sometimes the latter will be found empty, the operator either having neglected to replenish the supply or the liquid has been spilled by the can overturning. In such event priming material will have to be obtained by syphoning from the fuel tank or a connection thereof, a disagreeable task on a cold day.

At Fig. 4 is presented a priming device which may be operated from the seat. It is fitted easily and is not very expensive, the material required being a hand pump, copper tubing, four ball checks, three unions and an elbow. The tubing may be of other material than copper although the latter is preferable as when annealed it is easier to handle in making bends and turns.

The device illustrated was installed by a repairman who possessed a hand pump with a petcock attached, and the tubing. The ball checks and connections were purchased. The motor had core openings in the centre of the cylinder head and over the combustion chamber. These were removed, drilled and tapped to take four leads from the main line of piping.

Ball checks were installed in these members the former allowing fluid to flow into the cylinder but not out of the chamber. Short pieces of piping were utilized with unions to connect the main line being brought back to the dash, thence through this and attached to the petcock of the pump. Another tube was led from the shut-off valve and carried below the floorboards to the pipe leading from the fuel tank.

The operation is obvious. When the motor requires priming the petcock of the hand pump is opened and gasoline flows by gravity to the latter, the handle of which is raised, which action sucks in the fluid. The petcock is then closed and the handle depressed which movement forces the fuel through the pipe and check valves into the cylinders. In addition to priming, the appliance may be employed for flushing the motor with kerosene by disconnecting the pipe at the lower end of the pump and drawing in the fluid through the petcock.

REGARDING ELECTRIC LIGHTING.

Many owners whose cars are not equipped with electric lighting outfits desire to install some system that is inexpensive and requires but an elementary knowledge of electricity. If the car be fitted with a current generator which will permit the use of electric lamps in connection with the ignition system, the voltage of the device should be ascertained before fitting lamps in the circuit. If the speed of the magneto be variable; that is, not fitted with some form of a governor or regulating member, it should be taken into consideration in figuring the voltage of the lamp to be used. This will save expense in replacing burned-out members.

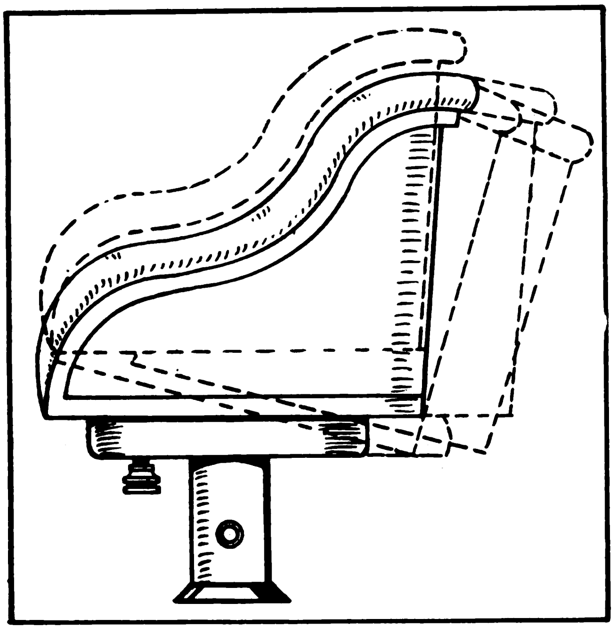


Fig. 5—Adjustable Driver's Seat Recently Brought Out Abroad.

The writer is in receipt of queries regarding a certain popular priced machine which is equipped with a current generator having rotary field magnets that revolve with and as a part of the flywheel. This device develops an alternating electromotive force from a few volts to as high as 30 in an open circuit, the amount necessarily depending upon the number of revolutions of the wheel.

This electricity can be employed for lighting; in fact, the K-W Ignition Company markets an outfit which is practical and complete. Some owners consider that the current may be used also for charging a storage battery by floating it on the line, but this is not correct as a direct current is required for that purpose. It may be done, however, by utilizing a rectifier, but the latter is expensive and would take up more or less room.

The storage battery may be employed as a reserve when the motor is not running, and the auxiliary member may be wired so that it may be used for starting purposes as well. Unless one is familiar with electricity it perhaps would be best to install a system that has been thoroughly tested.

AN ADJUSTABLE SEAT.

An English concern has brought out an adjustable drivers' seat which is illustrated at Fig. 5. By means of attaching this to a centre column the positions may be changed without the operator leaving his seat. It can be raised three inches and moved backward or forward five inches.

The mechanism provides for tilting at any angle, as indicated by the dotted lines in the drawing, and the seat also may be revolved. The advantage of a device of this kind is that in the case of a very tall or short man the seating accommodation may be fixed without altering the steering column, clutch or brake pedals. It also affords an opportunity for a change of drivers irrespective of their size and positions assumed while operating. The controlling mechanism is simple and is operated easily.

PECULIAR CAUSE OF OVERHEATING.

Upon first thought the average experienced operator of a car would not expect that an insufficient supply of gasoline at the carburetor would be a cause of overheating of the motor, but an instance in which this was primarily the cause was noted recently. The engine was a two-cylinder, and had never run well from the day it was new. It was rather hard to start and ran hot. The valves pitted so badly they required turning true in a lathe, and the exhaust valve spring lost its temper within 100 miles, etc.

The motor was more or less responsive to both throttle and air levers; started with the extra air shut off, and took almost the whole of the auxiliary atmosphere when running fast. If either the throttle or air lever were moved carelessly; that is to say, with a swift movement over a large portion of the quadrant, the engine promptly stopped firing, and had to be restarted. A cure of these difficulties was effected finally by simply adjusting the float so that when the car was standing still and the engine inoperative, the fuel stood on a level with the top of the jet.

The existing conditions were that the motor had two functions to perform under the original adjustment of the carburetor. One was the normal function of taking gasoline from the tip of the jet and atomizing it, added to sucking in air through the orifices provided in suitable proportions. The other was the abnormal function of sucking up fuel through a very fine tube. The second operation demanded more suction, and owing to the fact that most of that obtainable was wasted on the air openings, the remainder could not be relied upon to bring up the gasoline in the jet, and so the motor was difficult to start. As soon as this was accomplished, a second trouble arose. After cranking, the driver naturally leaned over to the levers to provide a little extra air. This increased the air openings upon which the scant supply of suction promptly wasted itself. As a result there was a dearth of gasoline at the jet, and consequently the motor stopped.

The operator upon restarting, imagining he had been too free with air, fell into the habit of running on too rich a mixture, causing overheating. This demonstrates the necessity of having the fuel level with the top of the jet in some carburetors and of verifying this point when the float needle has been ground in after long use. The test should be made with the vaporizer on the car, if possible, as few are set dead level on the machine.

CARE OF INNER TUBES.

Sometimes an inner tube leaks and upon examination small holes are noted and usually the motorist blames the maker for employing poor material. This is not the cause, says an experienced tire man, as the apertures are due to carelessness of the operator who allows small particles of dirt or mud to enter the envelope when fitting a new tube. The air pressure from without and within combine to grind the foreign elements into the rubber. In fitting the device care should be taken to clean both the shoe and tube. The tools utilized in removing the former should not be left lying around on the ground where they will collect dirt.

SOLDER IN VALVE CAP.

Occasionally the little piece of rubber located in the tire tube valve cap sticks and tears when changing tires and sometimes it affects the plunger. A small amount of soft solder dropped into the cap makes an excellent substitute the metal being sufficiently soft to bed itself against the end of the valve, and make a perfectly air tight joint. It will not adhere to the other metal and as it is not affected by oil or foreign elements it may be used for an indefinite time.

GRINDING DISCS OF CLUTCH.

Multiple disc clutches when used properly and given attention present little if any trouble and may be operated thousands of miles. On the other hand, if they were wrongly adjusted in the first place, the chances are that they will start slipping which movement very soon rubs away the lubricant between the rings, and the result is a continual grating until the clutch locks and takes up the drive solidly. When plates get to this stage there is only one remedy and that is to replace them with new members or have the old ones ground, which sometimes does not give entirely satisfactory results.

In connection with this operation it is noted that a new method of smoothing the plates has been brought out by an English concern, which uses a magnetic chuck on the grinding machine. These tools are admirably adapted for this work. Each of the thin rings is simply laid against the chuck and the electricity turned on, whereupon it is held firmly against the face of the plate, and there is not the least fear of its being in any way distorted. By this method the metal may be ground smooth on one side then reversed for similar treatment on the opposite side.

WHY PEDALS WEAR SHOES.

Those who do considerable driving in crowded traffic of the cities operate the clutch and brake pedals considerably more than the average driver, and in the continual contact and rubbing between the metal and the leather the latter suffers most; in fact, a pair of light soled shoes are soon reduced to a state where repairs are necessary. Obviously the remedy would be to employ heavy soles, but many object to these, as they claim they cannot "feel" the pedals. A driver whose work is mostly in the city treats the soles of his foot apparel in the same manner as the leather of the clutch by dressing them with castor oil, applying several coats and allowing the lubricant to soak in. This not only softens the leather but adds to its wearing qualities. The soles of new shoes may be similarly treated.

Preservation of Calcium Carbide—Calcium carbide is readily attacked by the air and the moisture contained in the generators and consequently decomposes during the storing, with the formation of acetylene gas. Aside from the loss, this decomposition is also attended with dangers. One of the oldest methods of preservation is the saturation of the carbide with petroleum. In using such carbide a layer of petroleum forms on the surface of the water in the generator, which effectually prevents the water from evaporating.

A VALVE LIFTING KINK.

The amateur in attempting his first removal of a valve in preparation for grinding, is often bothered in lifting it high enough to be grasped by the fingers. It may be operated easily by inserting the tang of a file in the slot of the valve stem and moving it upward as far as it will go, then holding the stem with the point of a screw driver while another lift is made with the other tool.

STEERING WHEEL WARMING DEVICE.

Many drivers complain of cold hands during the winter, although different forms of gloves are worn. One of the reasons for this is that in gripping the wheel the circulation of the blood is more or less impeded by the pressure exerted in holding the member. Some operators find that the old-fashioned woolen mitten is the warmest covering for the hands, but more or less difficulty is experienced in gripping the wheel because of the smoothness of this member.

At Fig. 6 is shown a method of wrapping the circle with felt which will exclude the cold and provide a good surface for the woolen mittens. To prevent the material from slipping, friction tape is sewed to one side, as depicted in the drawing. It should be less in width than the felt.

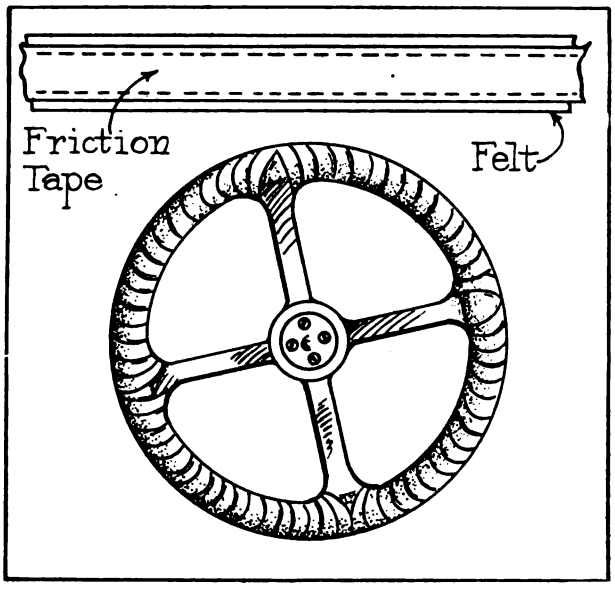


Fig. 6—Illustrating How a Wheel May Be Wrapped with Felt Sewed to Friction Tape.

The first step is to cut the felt into strips about .75 inch and sew as many together as will be needed. The tape is then stitched on and the rim of the wheel covered as outlined. The edges of the felt should be wrapped close together to provide smoothness. When the wheel is covered the two ends of the material are sewed together. The tape will grip the wood firmly and the felt will not be as cold as would the original material. Another advantage will be that the covering will absorb vibration and driving will not be so tiresome.

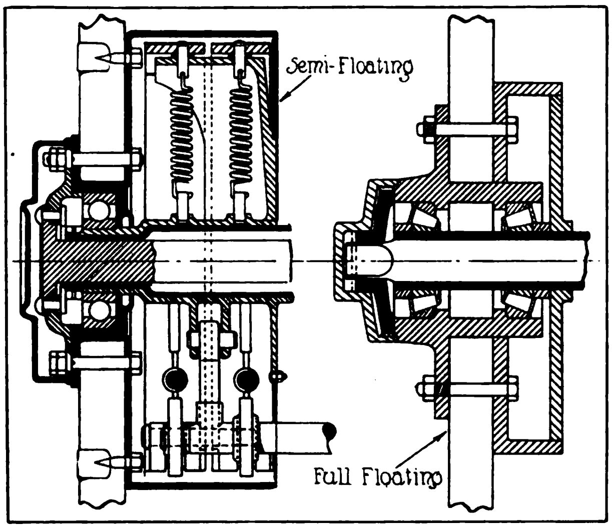
Cleaning of Colored Leather—Stained leather shoe covers can be cleaned and be made to look as good as new by applying the following mixture: Pour carbon bisulphide on non-vulcanized gutta-percha, and allow it to stand about 24 hours. After shaking well add more gutta-percha gradually until the solution becomes of a gelatinous consistency. Apply to leather and allow to dry about three hours. To remove gutta-percha, rub with fingers and roll off. The color is not injured the least. Only those leathers on which a dressing containing starch has been used look a little lighter in color. The dry gutta-percha can be dissolved in sulphuret of carbon and used over again.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Semi and Full Floating Axles.

(110)—I am greatly interested in your "Correspondence with the Reader," and believe you will cheerfully answer these questions for me: What is the difference between a semi-floating and full floating rear axle? What advantage or disadvantage has the four-cylinder upright motor with cylinders cast en bloc over one with cylinders cast separately or in pairs? Is it true that a two bearing crankshaft of an en bloc motor has an advantage over the three or five bearing crankshaft of the motor with cylinders separate, or in pairs? A. J. RIKER.
Moundsville, W. Va., Oct. 8.

In the full floating type rear axle the housing is constructed substantially in order to support the weight of the car. Each outer end of the tubing surrounding the axle is provided with a hardened steel bushing or cup upon which the balls or rollers of one of the driving wheel bearings are adapted to run, so that the wheels are entirely supported by the ends of the housings. The differential gears have their bearings within the central expanded portion of the housing. Each end of the two axle shafts is squared and fits similar recesses in the hubs of the gears of the differential. The outer ends of the shafts enter corresponding squared out cavities in the hubs of the driving wheels. This makes for a form of jaw clutch and a certain flexibility is given to the power transmitting portion of the axle and any slight deflection of the casing results in no binding of the moving parts. This construction is varied in several ways but the principles are similar.



Depicting Types of Semi and Full Floating Rear Axles.

In the semi-floating type the wheels are mounted directly upon the axles, which carry the weight of the car as well as transmit the power. The axles revolve in bearings mounted in the axle housing. The difference in construction will be noted in the accompanying drawing which depicts full floating and semi-floating types of rear axles.

The advantages claimed by the advocates of four or six-cylinder motor cast en bloc is a shorter and more compact power plant, and there is a growing tendency among the automobile manufacturers to adopt this design. The twin and single-cylinder castings are favored by many makers, however.

Regarding the two bearing crankshaft of an en bloc motor and the type fitted with three or five bearings with cylinders cast in pairs or singly, the designers strive to achieve the same results, that of strength and durability. It is obvious that where two bearings are employed these must be larger and stronger than where five are utilized and these points are considered in the design of the crankshaft and crankcase, which are shorter with the en bloc type of engine.

Acetylene for Starting Motor

(111)—If one should install a motor starter of the acetylene type and if a large quantity of gas should be permitted to go into the cylinders, would there be any danger in exploding the charge? What I wish to know is would there be any danger with a large amount of acetylene and if it would be injurious to the engine. Suppose the device to be so arranged that there would be small brass tubes leading from the distributor to the cylinders. Would there not be enough gas left in these tubes after the motor started? If so would there be any danger of these tubes becoming hot enough to cause the gas to explode? UTTUS WHEAT.
Holland, Texas, Sept. 15.

Various methods are utilized in self-starters employing acetylene, but the basic principles are similar, that of mixing a stated quantity of air with the gas, conveying it to the combustion chamber of the motor and exploding the mixture by a spark. As with gasoline, it is essential to know the proper amount of air to combine with a given quantity of acetylene to obtain the correct efficiency. Too little or too much in proportion to the fuel will result in a poor mixture and starting conditions will be affected thereby.

An explosive point is reached when only 3.35 per cent. is acetylene and the balance air. Regarding the correct proportion of acetylene to air to ensure proper combustion and maximum force, the experiments of Berthelot and Vielle show that with a 10 per cent. acetylene and 90 per cent. air mixture an explosive force of 11 atmospheres is derived. With an increase in proportion of gas up to 50 per cent., at which point it is 22 atmospheres, the maximum is reached and beyond equal parts, it decreases.

Supt. O. H. Skinner of the Prest-O-Lite Company, Indianapolis, Ind., states that the best results are obtained by using one part acetylene and 10 of air, approximately, and that when this is ignited it will burn explosively and produce a force considerably greater than if gasoline were used, provided, however, some means of obtaining air is installed other than taking it through the intake manifold.

In considering the application of acetylene in a form of self-starter, some form of regulating valve should be incorporated and when the member is of the automatic type the sizes of ports or valves open from the line would accurately gauge the amount of gas being used. The pressure of the latter when brought from a tank should be reduced, as acetylene should not be piped about the car at a pressure greater than two atmospheres, or about 30 pounds. The pressure may be reduced by fitting a two-way valve to the tank when the latter is utilized both for starting and lighting.

Regarding the effect of acetylene upon the cylinders, a well known authority states that it will not injure them provided the mixture is correct and that the explosions brought about are not unduly high. The tubes carrying the mixture to the cylinders would not become heated enough to explode any gas left in them if there were any. If the device should be so constructed as to leave any mixture in the tubes it would be drawn into the combustion chamber by the instroke of the piston, and as the amount would be small, it would not affect the gasoline mixture operating the motor. It is obvious that the acetylene from the tank would be prevented from flowing except when the self-starter was being employed.

Regarding Disco Self-Starter.

(112)—I am considering a self-starter and regarding the Disco system desire to obtain the following information: When the engine has stopped at dead centre and does not start the first time, what becomes of the explosion, also on a cold day when it fails to start? Has there ever been such a thing as blowing off the cylinder head with this starter? Will the explosions injure the motor in any way when it fails to start?

Red Hook, N. Y., Oct. 11.

JOHN R. FINGAR.

Regarding the motor stopping at dead centre, the maker of the Disco device states: "Should the Disco fail to start the motor, owing to the latter being on dead centre, it is only necessary to make a quarter turn with the crank and then start on the spark." Stopping on dead centre rarely occurs, however.

As to an explosion taking place and not enough energy being developed to start the motor, or in other words, if the pressure be not strong enough to force the piston down far enough to bring up to dead centre the piston of the next cylinder to fire, the burnt gases will remain and be forced out through the exhaust valve when the motor is cranked a quarter turn or the cylinder in question charged and exploded properly.

Regarding blowing off of a cylinder head with the Disco system, the writer does not see how this could take place, owing to the fact that the gas and air is mixed in proper proportions by the distributor of the system. As to the proper proportions and danger of injury to the cylinders, these questions are answered in the previous communication.

Locating Poles of Battery.

(113)—I acquired a second hand storage battery recently and wish to do my own charging. The pole marks are not shown on the battery. Will you please tell me how to locate them? WILLIAM E. NEVINS.

Richmond, Va., Sept. 12.

Attach a wire to each terminal and place the ends in a glass of water taking care that they do not touch. The negative wire will give off bubbles and this terminal of the battery should be marked thus —. The other will be the positive and should be marked thus +. In charging, the leads from the charging apparatus should be similarly connected.

Driving Out Ball Races.

(114)—I have a model ——— car and the large ball races in the front wheels are worn out. Have secured new members from the factory but cannot get the old members out. Have tried the suggestions contained in instruction books, but without success. Have been told that I will have to apply heat to draw the temper and then break up the races with a cold chisel. Is there any method you can suggest? C. B. FORDHAM.

Portland, Ore., Oct. 7.

The easiest and quickest way to remove the races is to dismantle the wheel. The hubs and flanges may be taken apart easily by removing the nuts and driving out the bolts. The hub and flange will come apart and it will be noted that the flange member in which the ball race is located has three holes. These were incorporated by the manufacturer for the purpose of removing the races when other means fail. By utilizing a punch and hammer the race may be removed. The dust ring will come out with the race so it will not be necessary to remove the former separately. In using the punch, it should be employed alternately in each opening of the flange to equalize the driving strains. In fitting the new member, it should be driven in with a lead mallet or with a block of hard wood inserted between the hammer and race, as these members are hardened and break easily.

Adjusting Babbitt Connecting Rods.

(115)—The connecting rods in my model T Ford need adjusting instructions for which are given in the book. I notice it is stated that they should not be taken up too tight. How is one to determine this? The book says the connecting rod should barely turn of its own weight when inclined in a horizontal position. This would be possible if the cylinders were removed, but I wish to adjust the bearings without going to this trouble.

W. D. M.

Pepperell, Mass., Sept. 19.

It is an excellent plan to follow the instructions of the maker in the matter of operating and adjustment. The rods may be taken up as stated by thinning down the shims a trifle at a time, and replacing and tightening up the connecting rod and bolt, trying the snugness before replacing the cotter pin. The rod should move to and fro fairly easily on the crankpin when a little pressure is applied. Some repairmen make it a practise to take up the bearings very snugly, but if one is not familiar with the work it is best to have them a little loose rather than too tight. If the shims have to be filed care should be exercised in making the surfaces even. Set up each bolt and nut as hard as possible and fit the cotter pin.

Ice Boat Design and Construction.

(116)—Will you please give me some information on the subject of ice boat construction? I wish to build one, a power driven one, and wish to use the engine from an old automobile. This is a single-cylinder motor of 3.5 inch bore and four-inch stroke. I have planned to have two runners ahead and one spiked wheel behind. Will it be a good scheme to steer by the two forward runners, using the steering knuckles of the old auto? I would like to use some kind of friction drive. Could you give me any advise in the practical design of a wheel of moderate cost? Is there any way of using one of the old auto wheels, which has a steel rim and 28 inch diameter tire? In using this, would it be feasible to use the brake and a chain drive to the sprocket now on it? Is there power enough in this little engine to drive the machine over hard snow? I would like to have you give me a number of hints about ice boat design and construction, if it is not asking too much. L. R. G.

Clifford, Mass., Sept. 23.

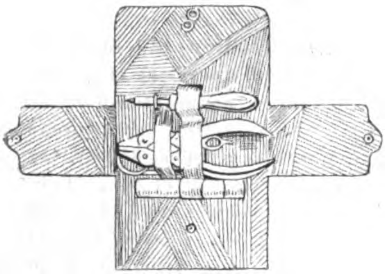
The engine you have will be suitable, although its power which will not exceed five horsepower, would not allow running the ice boat over snow, even hard packed snow. The two runners ahead, hung on the steering knuckles of the automobile, and used to steer the boat, will work all right as will also the single driving wheel behind. In preparing the wheel, you can use the sprocket and brake drum now on it, although it is doubtful if the brakes will do much good.

On the driving wheel, it would probably be advisable to have a form of leather outer shoe made for the tire, this being studded with spikes to take hold of the surface of the ice. If this cannot be done, remove the tire and use in its place a regular leather tread tire. Or, if the tires on the automobile are old, and you do not care to keep them, use them with tire chains on the driving wheels, using the various tires alternately. The driving wheel must be made so as to adjust itself to the surface it is passing over, that is, it should be spring suspended, while in addition, it would be well to make such a suspension that the driver of the boat can lift it off of the surface of the ice and shut off the power, when he does not want to use it.

A number of hints on ice boat design and construction will be found in an article published in the Automobile Journal of a recent date on this very interesting subject.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

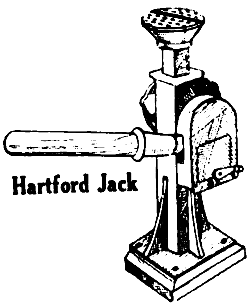


Cinch Repair Kit

The Cinch Tire Repair Kit, marketed by the Hailstone & Winmore Company, Northampton, Mass., is a device with which it is claimed an inner tube may be repaired when punctured in a very short time without removing the member from the wheel. The outfit comprises a number of rubber plugs, a cutting tool, a wire spreader and a pair of patented pliers. The patching plug is made in two parts, having a space between the sections, and so devised that these may be compressed, thus sealing the aperture in the inner tube. The wire spreaders are utilized for temporarily enlarging the puncture and for making easy the insertion of the plug which is of rubber and metal. It is stated that an inner tube may be repaired in less than a minute, that it will not leak and that the repair is permanent.

—— ★ ——

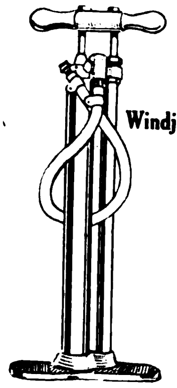
The Hartford Auto-Jack, manufactured by the Hartford Suspension Company, Jersey City, N. J., maker of the Truffault-Hartford shock absorbers, will appeal to motorists who desire a jack which will lift a heavy car without undue effort. The working parts are constructed of solid chrome nickel steel fitted in a casing of tough malleable iron and it is pointed out that the tool will survive the roughest treatment. It operates up or down, these movements being possible by the moving of a small lever, and as the positions are indicated there is no guesswork when utilizing the device.



Hartford Jack

—— ★ ——

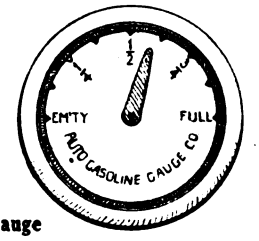
The Windjammer Automobile Tire Pump, manufactured by the Bridgeport Brass Company, Bridgeport, Conn., is said to differ from those of usual construction as to disassemble the device it is only necessary to unscrew one nut. The cylinders are constructed of heavy gauge seamless brass tubing and these are fastened into the foot base in such manner as to be absolutely air tight. This operation is performed by a special process. The top is made of malleable iron and is said to be practically unbreakable. The Bridgeport product is provided with a heavy coil spring on the piston rod, this preventing any violent upward movement from damaging the top.



Windjammer Pump

—— ★ ——

The Auto Gasoline Gauge is being placed upon the market by the Specialty Sales Company, Racine, Wis., and is designed for attaching to the fuel tank to denote the amount of gasoline in the container. It is very compact and it is claimed that it may be installed in 15 minutes by the utilization of the special tool which accompanies each device. It comprises a metal tube which extends from the top to the bottom of the fuel tank, a float and a gauge. The casing has a spiral slot extending from top to bottom, half way around its circumference. This slot engages with arms on the float which slide freely on a straight staff. The latter is pivoted at either end of the casing, and at the upper end is an indicating hand which records the movement of the float below. The casing also serves to prevent the slopping of the fluid and disturbing the operation of the float. When the gauge is installed in the tank the dial lies in a horizontal position close to the surface and it is said that a perfectly steady reading is given by the indicator. The dial is calibrated, denoting empty, full and intermediate positions.



Auto Fuel Gauge

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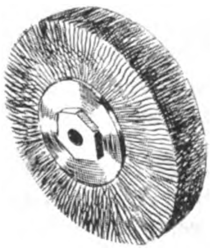
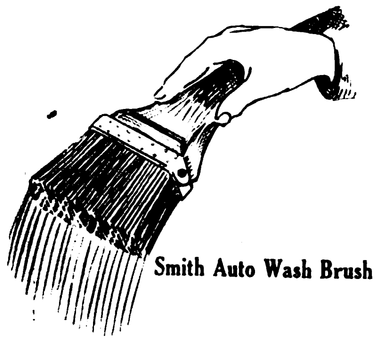
The Economy Wire Brush, produced and marketed by the Williams Foundry & Machine Company, Akron, O., maker of automobile tire repair equipment, is designed to be utilized with a buffing stand, but it may be operated on an ordinary emery grinder. Where there is much work to be done, it is claimed that the brush will save considerable time in preparing casings and tubes for cement and new material. The device is constructed of steel wires in suitable lengths and it is claimed that the material will not break. It is made with different diameters as well as width of faces.

Economy Wire Brush

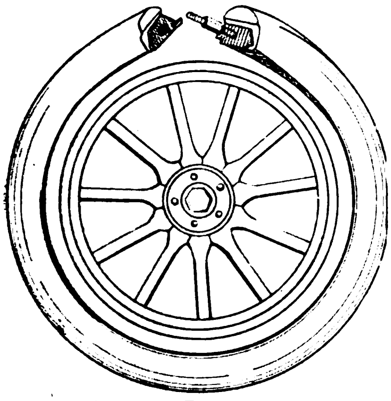


The Auto Wash Brush, marketed by the I. J. Smith Manufacturing Company, 4241 Park avenue, New York City, is designed more especially for owners who take care of their own cars, although it is constructed for garage service as well. The brush is made of a high grade soft hair through which the water passes, keeping it clean, as well as insuring a constant flow of fluid upon the part being washed. It is fitted with a special coupling to which the hose is attached and the connection also forms the handle. Extra brushes may be purchased.


Smith Auto Wash Brush

★

The American Emergency Tire, marketed by the American Automobile Specialty Company, 510 Ashland boulevard, Chicago, is as its name implies, an emergency shoe for replacing a blown-out or badly damaged pneumatic tire while on the road. It consists of a length or strip of solid rubber tire material perfectly conformed to the shape and size of the channel of any given wheel. It is reinforced internally, with high carbon steel wires and these are welded at their ends to two steel plates which form parts of a turnbuckle. The tire is made tight and secure in the channel, between the rims of the wheel, through the action of the right and left hand threads of a double screw engaging in each end plate. The lateral strain is on the rims of the wheel. The turnbuckle is hidden from view and its arrangement permits of the two ends of the tire being joined closely and without a projection.


American Emergency Tire

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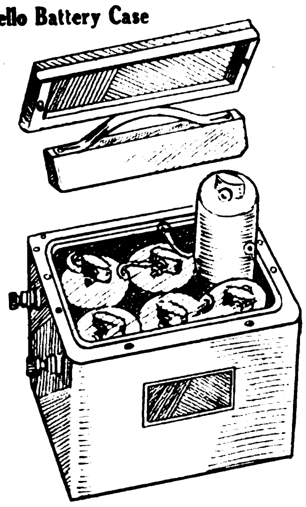
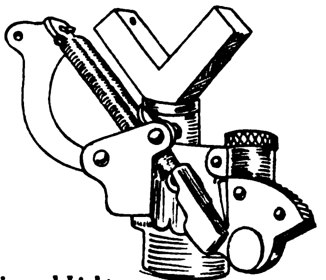
The Cello Battery Case is produced and marketed by the A. S. Campbell Company, 284 Commercial street, Boston, and is specially designed for automobile or marine service, as the hermetic case protects the dry cells from all moisture. The walls of the holder are .5 inch thick and the interior of the container is sealed with a water proof compound. The lower section is fitted with a bronze rim equipped with a substantial rubber gasket, which is compressed when the cover is fitted, inasmuch as this also has a gasket which presses against the rubber. The cells are held securely by a block on which is mounted a spring. Two binding posts or terminals are fitted to the exterior of the holder. The case is adaptable to any make of dry cells and is constructed to hold six batteries. It is neat and compact and the exterior well finished.

Cello Battery Case



★

The Universal Lighter differs from those of usual construction, as by it the acetylene headlights may be lighted by a simple movement of the finger. It does not require any wiring or batteries, the spark being generated by a friction file passing over a sparking alloy, the movement throwing a shower of sparks directly into the path of the flame. It is claimed that the sparking alloy will endure over six months and it is enclosed in a small thumb nut with spring tension to keep it automatically in proper adjustment until worn out. The sparking attachment is sold separately, and costs but a few cents by the dozen. The lighter is clamped around the base of the burner and is so constructed that it will fit any type of burner. It is marketed by the Waite Auto Supply Company, Providence, R. I.


Universal Lighter

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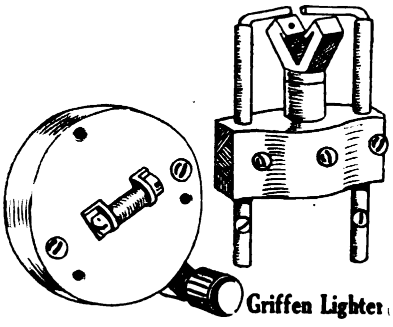
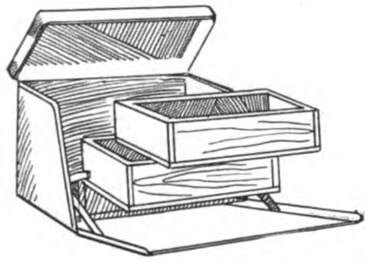
The Griffen Lighter is the invention of Stephen J. Griffen, 306 Linwood avenue, Bridgeport, Conn., who devised it for application to his single-cylinder car. It comprises a switch having a spark gap and a bracket for attachment to the acetylene burner. The burner device has two points in proximity to the path of the flame. When the switch lever is moved, the direction of the secondary current is changed so that it makes the circuit of the spark gaps at the burners, returning to the spark gap on the switch, and thence to the plugs as usual. The current to the plugs is interrupted but for the fraction of a second and the maker claims it does not interfere with the operation of the motor, also that the lighter is adaptable to any type of internal combustion engine.

★

The Gray Telescoping Tool Box, manufactured and marketed by the Gray Specialty Company, 148 Avon avenue, Newark, N. J., is a practical device for the automobile as its construction is such that any tool may be secured easily without disarranging the


Griffen Lighter

other members. This is of value on the road as considerable time is saved, and another advantage is that the tools are always in sight. The front and top of the box are hinged and the drawers swing outward, permitting easy access to the contents. The container is constructed of heavy gauge steel, and is 16 inches long, 10.5 high and eight wide. The compartments are of wood, preventing rattling of the tools. The device is equipped with a substantial brass trunk lock and the exterior is highly finished.


Gray's Telescoping Tool Box

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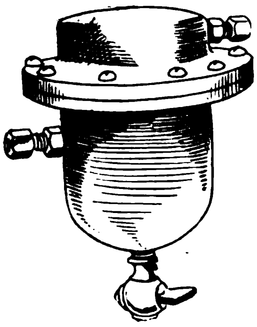
The Peerless Gasoline Separator is a practical accessory as when incorporated in the main fuel line it catches all moisture and foreign elements that may be present in the gasoline. The device is constructed of brass or aluminum, the former being designed for service on motor boats operating in salt water. The separator is in two sections, the fuel entering the lower and passing up through a chamois strainer into the upper chamber from whence it flows to the carburetor in the usual manner. All water or dirt being heavier than the fuel drops down to the bottom of the lower compartment whence it is removed easily by opening a petcock with which the filter is equipped. A special grade chamois is utilized and the maker points out that it will not harden or become dirty as it is maintained in a moistened condition by the flow of the gasoline. The device is made in two sizes by the Stott-Crowley Manufacturing Company, Detroit.

PEERLESS GASOLINE SEPARATOR



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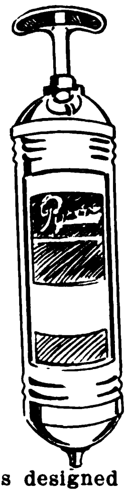
The Pyrene Fire Extinguisher is a compact device designed for attachment to the automobile, being 14 inches long and but three in diameter, and weighing only five pounds. The contents are impervious to heat or cold and it is claimed will not freeze at 60 degrees below zero, Fahrenheit. The liquid is not maintained under pressure, is proof against explosion, and will not deteriorate with age. Containing neither acids, alkalis or salts it will not injure any material with which it is brought in contact. The Pyrene Manufacturing Company, New York City, has designed a holder for attachment to the dash. The device itself is finished in enamel, brass or nickel.


Pyrene Extinguisher

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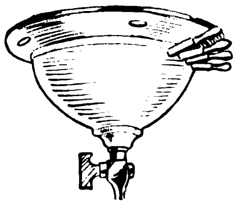
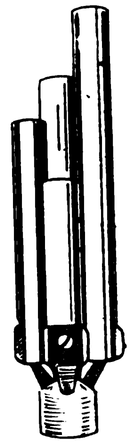
The E. & J. Condensation Cup is a device produced by the Edmund & Jones Manufacturing Company, Detroit, for attachment with the generator or gas tank, and by it all moisture is collected before it has an opportunity of reaching the acetylene burners. It is compact and easily installed, and is provided with two intake connections and a like number of outlets. It is placed below the generator or tank and any fluid that may collect is drained easily by the opening of a petcock with which the cup is provided. It is constructed of high grade material and is inexpensive.

E. & T. Condensation Cup



The Aermore Exhaust Horn is manufactured by the Aermore Manufacturing Company, Chicago, and it is claimed that its construction is such that it will not become clogged with soot and that it will clean itself automatically. It comprises four brass tubes having apertures and constructed on the principle of an organ. It is operated by the exhaust of the motor and may be attached to any convenient point of the exhaust pipe. A special tail-end valve is supplied if desired. The signal is operated by pedal and it is claimed that the horn produces the four major notes of the scale simultaneously and that the volume of sound is controlled easily.


Aermore Horn

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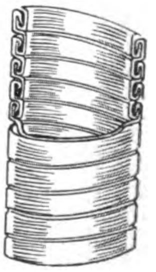
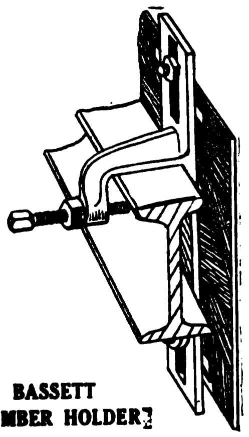
A Flexible Brass Conduit for covering the exposed wiring on motor cars or protecting gas tubing, etc., is manufactured by the American Metal Hose Company, Waterbury, Conn. It is made either of brass or steel and the metal strips are interlocked by a special process. The tubing may be bent to a considerable angle without affecting the joints. It is made plain or lined with asbestos, in different finishes, and is produced in various sizes to meet the requirements of the purchaser.


Flexible Brass Conduit

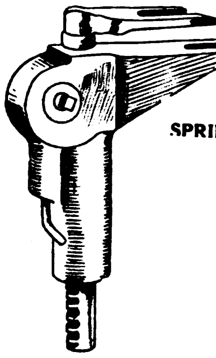
Bassett Number Plate Holder is one of many practical and useful accessories brought out by Charles A. Bassett, Providence, R. I., and is made in two styles for attachment to the front axle and rear of the automobile. The front device comprises a clamp with screw and locking nut and is so designed that it may be slipped over the I beam section axle and adjusted and locked easily. The number plate is attached to the holder by wing nuts and means are provided for adjusting the position of the plate.



BASSETT NUMBER HOLDER

★

The Bryant Spring Remover, marketed by Stevens & Co., New York City, is compactly designed little tool for removing or replacing valve springs and is made in three sizes to fit any diameter springs. It differs from the usual valve tool as the spring is compressed or released by a rack and gear arrangement. Means are provided for locking the device in any desired position. The steel engaging device on the end of the lifting rack is a feature, as it will pass easily between the coils of the valve spring and may be twisted slightly if desired. The rack is of cold rolled steel, accurately cut to mesh with the cut gear, and the catch pin is of steel and will hold equally well in either direction. The engaging device is of high grade material, fitted and pinned securely to the rack, and the tool is nicely finished, comes in a box, and is inexpensive.



BRYANT SPRING REMOVER

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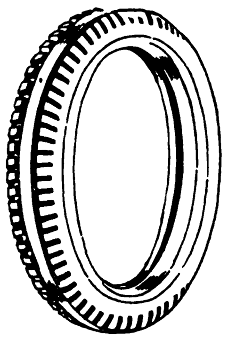
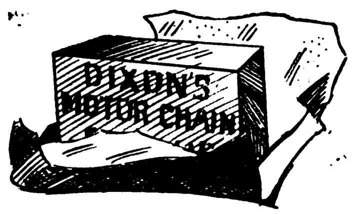
The Tyrian Anti-Skid Tire is the product of the Tyer Rubber Company, Andover, Mass., and it is claimed by the maker that its design is such chains are not necessary, as the shoe will grip the road. The tread has a number of block like corrugations running transversely and between these is a strip extending in an opposite direction. It is pointed out by the maker that the two evenly moulded channels running around the tire allow the shoulder in the middle to grip the road, preventing skidding. The cross channels eliminate forward slip and make easy the starting of the machine.



TYRIAN ANTI-SKID TIRE

★

Dixon's Motor Chain Compound, manufactured by the Joseph Dixon Crucible Company, Jersey City, N. J., is a composition of graphite and a lubricant especially adaptable to motor chains, and comes in solid form, neatly and compactly wrapped. It is well known that the best treatment for driving chains is to cleanse them thoroughly and immerse them in a bath of graphite and tallow or similar material. This involves melting the tallow and mixing in the graphite. The Dixon preparation not only saves this work but insures the proper proportion of the lubricants and the right grade of graphite. A quantity of the compound, sufficient to cover the chains, is cut from the block and melted at a temperature of 180 degrees Fahrenheit, after which the members are plunged in cold water to harden the lubricant.



DIXON'S CHAIN COMPOUND

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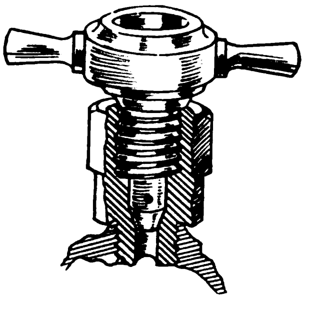
The Morgan Priming Cup, is the product of B. Morgan, Newport, R. I., and possesses many advantages over the usual construction as it is claimed by the maker that leaking, sticking or the possibility of broken handles are prevented. It comprises two parts, one of which is screwed into the cylinder head, while the other is screwed into the bushing member and when rotated provides a suitable opening for the priming fluid. Another feature of the device is that it gives a large opening into the cylinder, facilitating valve or ignition timing by the piston. The Morgan priming cup is made in standard sizes, either male or female, and is constructed of high grade material.



MORGAN PRIMING CUP

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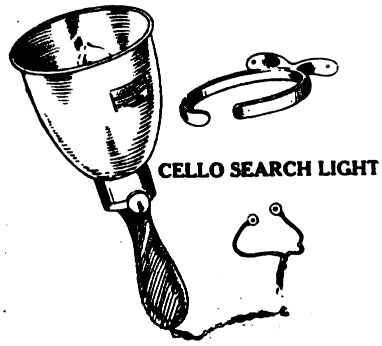
U-Vulk is a liquid preparation by the utilization of which tires and inner tubes may be vulcanized without employing heat. It is marketed by J. E. Gimperling & Son, Dayton, O.. and it is stated by the maker that containing no acid it will not injure a tube or casing. It is also claimed that cuts and tears in casings may be repaired easily and quickly in a few minutes and that the operation is so simple that it may be performed by those not familiar with tire construction. It will appeal to those who maintain their own machines, and in addition to being of service for tires, may be employed to repair rubber wearing apparel and appliances such as the horn bulb. The U-Vulk outfit is very complete and inexpensive.

The Cello Searchlight, manufactured by the A. S. Campbell Company, Boston, is designed especially for service in locating street signs, guide boards, door numbers, etc., and differs from those of usual construction inasmuch as it is equipped with a hanging bracket for attachment to the car. The latter arrangement makes for convenience, as the lamp is always accessible. The diameter of the reflector is three inches and the bulb is a tungsten, eight candlepower requiring a six-volt current. The lamp is nickel plated and it is claimed by the maker that it will throw a powerful beam of light.



CELLO SEARCH LIGHT

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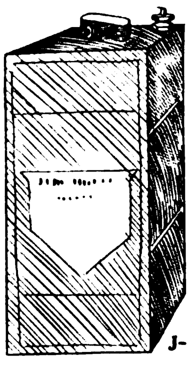
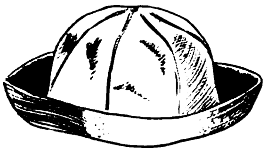
The J-M Dry Cells, made by the H. W. Johns-Manville Company, New York City, are in two types, round or square, and are manufactured especially for ignition work in motor cars, gasoline motors, signal horns, small lights, bells, etc. They register 1.5 volts a cell and are made in 20, 30 or 35 amperes capacity. It is pointed out that two series of J-M cells connected in compound series multiple, instead of series or multiple, will afford about three times the life of a single series on current, on account of the reduced rate of discharge. The J-M batteries are guaranteed to give entire satisfaction.



J-M BATTERY

States Folding Hats have been brought out by the States Manufacturing Company, Chicago, and will interest a large class of motorists who employ their machines for travelling to and from the house and office, and who desire a hat that may be folded and placed in the pocket when not in use. The member is very light, made of silk and wool and in nine different shades. Its design is such that it may be adjusted easily to any position and is adaptable to both sexes.



STATES FOLDING HAT

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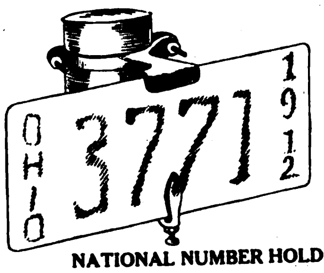
The National Number Holders, produced by the National Motor Supply Company, Cleveland, O., are made for attachment to the radiator cap, also to be fitted to the rear lamp bracket. The former are adjustable and will fit any car and carry any size of license plate. The device is attached easily to the filler cap being constructed in two parts and provided with retaining bolts and locking nuts. The holders are made of high grade material and are finished carefully in black japan.



NATIONAL NUMBER HOLDER

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The Dayton Tire Bandage, manufactured by the Dayton Inner-Tire Company, Dayton, O., is an adhesive bandage, nine feet long, three inches wide, of two-ply, 16-ounce tire fabric and designed for emergency use in the event of a blow-out or bad cut to the casing. The ends of the bandage are equipped with large brass eyelets and means for fastening. It is stated that the bandage cannot slip and that dirt or water is eliminated by the adhesive qualities which are incorporated in it.

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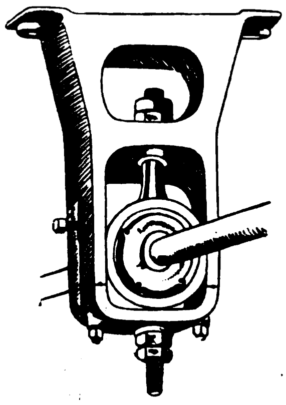
The Hess-Bright Hanger, made by the Hess-Bright Manufacturing Company, Philadelphia, well known maker of bearings, possesses many advantages over the ordinary form of hangers as by the utilization of ball bearings instead of plain members, friction is reduced to a minimum, power cost reduced, and economy effected in operation, as well as in space in shafting. Careful experiments conducted by the company developed the fact that with ordinary babbitt bearings there is a considerable loss due to friction and that with Hess-Bright ball bearings the coefficient of friction is but one-sixth of one per cent. Another feature emphasized of the ball bearing hanger is that it rolls true in contact regardless of shaft deflection, does not heat and requires but little lubricant for proper operation.



HESS-BRIGHT HANGER

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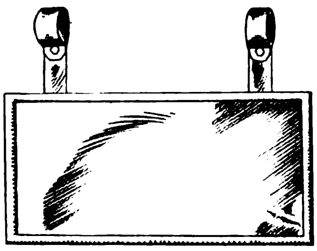
The Holt & Beebee Mirror is manufactured by Holt & Beebee, Boston, and is a practical and useful accessory for the automobile, especially where operated in heavy traffic. It comprises a mirror in a suitable frame and includes means for attaching to the windshield or the latter's frame. It allows the driver to note at a glance the movements of all vehicles behind, thereby preventing the possibility of accidents. It is also of service when on the road as the movement of a machine approaching from the rear may be discerned easily.



HOLT & BEEBEE'S MIRROR

Recent Patents of Interest

Dow Ignition System.

Willard A. Dow, Braintree, Mass., has patented an ignition system for internal combustion engines. It is very compact, comprising as it does, magneto and battery circuits, also an induction coil and switch. Provision is made for attaching the various primary, secondary and ground wires and for cutting in the coil or magneto circuits as desired. Being in cartridge form it is installed easily on the dash of an automobile.

Swearingen Muffler.

The prohibiting of the use of cut-outs on mufflers has stimulated the efforts of inventors to produce a muffler which will not only reduce the noise of the exhaust to a minimum but back pressure as well. Zachariah Swearingen, Oscealo, Ia., has been granted a patent for a silencer which is fitted with removable heads, the latter being provided with suitable openings for the admission and egress of the burnt gases. The interior of the device is equipped with a deflector of concavo-convex design, also conical and other similar member. The components are held together by means of tierods and it is claimed by the inventor that the muffler may be disassembled and cleaned easily.

Pennock Horn.

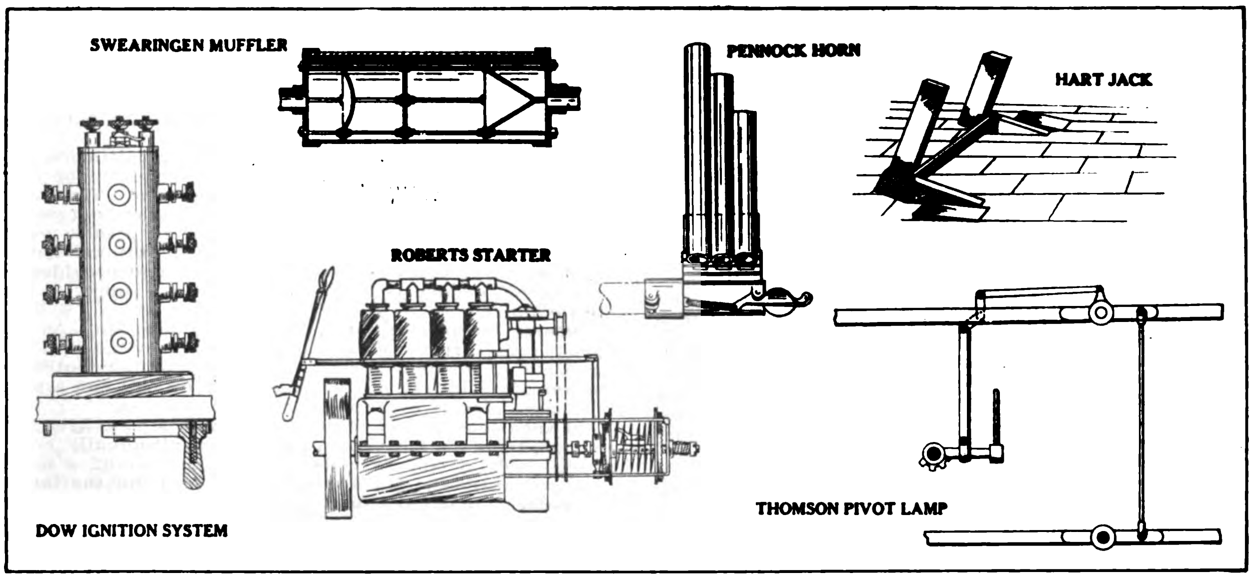
Willard Pennock, Minerva, O., has been granted a patent for a motor car horn operated by the exhaust from the engine. The three tubes are similar in construction to the usual tube horn but the passages for the gases are slotted and means are provided for registering these spaces, as well as for directing the flow of the exhaust through the signal and for interrupting the same.

Roberts Self-Starter.

A large number of patents has been granted of late for self-starting devices for automobiles. Judson O. Roberts, Cripple Creek, Col., has patented a mechanical starter for gas engines, which comprises a reciprocating starter shaft, a coupling adapted to engage said shaft with that of the motor, also a coil spring centred around the starter shaft. The spring is supported by a pair of wheels having guide engagements, a number of pawls and a dog controlling their movements. An auxiliary spring is provided to maintain the connecting coupling from engagement when the device is not in service. Pivotally connected to the starting mechanism is a lever in turn secured to a rod which is actuated by a lever conveniently placed to the driver or operator. Means are also provided for rewinding the spring by the power of the motor.

Thomson Pivot Lamp Device.

Among the latest devices for mounting the headlights of the motor car so that the members will be turned simultaneously with the front wheels, is the the invention of Arthur Gale Thomson, San Francisco, Cal., to whom a patent has been granted. The rotating means are obtained by mounting the lamps on a turntable device and the lights are operated together by means of a connecting tierod, which actuates the bell cranks secured to each lamp. Motion is imparted to the device by the steering mechanism which operates a series of pivotally mounted levers.



Depicting Some of the Recent Ideas of Inventors Relative to Devices Applicable to the Motor Car and Its Allied Industries.

Hart Automobile Jack.

Charles A. Hart, Findlay, O., has been granted a patent for a novel form of automobile jack by means of which a motor car may be run onto the member and jacked up by a tilting movement. The jack comprises a tiltable frame, including standards, the latter being provided with base fulcrum members. Each standard has on its underside main and auxiliary bearing surfaces extending at an angle to one another to support the frame in a tilted or vertical position. Runners are fitted, these being for the purpose of receiving the wheels of the vehicle and pivotal means also are provided.

OTHER PATENTS GONE TO ISSUE.

Spring Wheel, Alvin R. McEntire, Folsom, Ga. A vehicle wheel comprising a hub, a number of spokes slidingly mounted and coil springs arranged between the hub casing and retaining nuts.

Lathe Attachment, John M. Palmer, Chicago, assignor to the Universal Tool Company of that city. A lathe attachment, a turret head for carrying a plurality of lathe tools, and a substantially concentric shank extending therefrom, said head and shank having a tool receiving socket therein.

Carburetor, Nathaniel C. Stamps, Ocean Park, Cal. A carburetor having the usual mixing chamber and outer air passages but provided with a movable thimble device having a central air passage and means for controlling the air passing through the inner and outer passages.

Clutch Mechanism, Frank B. Allen, Salt Lake City, Utah. A clutch mechanism including in combination a transmission ring, a split gripping ring located within the same, a hub, sleeve and means for forcing the gripping ring into contact with the transmission and operating toggle levers.

Motive Fluid Mixer, William G. Cross, Seneca Falls, N. Y. A motive fluid mixer for internal combustion engines having a transfer passage for the fluid to be mixed with gas to provide a charge of motive fluid to the motor.

Roller Bearing, Chester Arthur Heinzelman, Belleville, Ill. A roller bearing comprising an inner member mounted on the spindle of the bearing and provided at one end with an undercut recess; a beveled surface which tapers oppositely to the sides of said recess, and a roller retaining ring fitted with yielding fingers which have lugs that project into said undercut recess.

Lock Nut, George O. Douthit, Summers, Ark., assignor to M. M. McCoy, Westville, Okla. The recessed or threaded portion of the nut is provided with teeth which grip the bolt and the device is secured by means of a locking pawl.

Sash Lock and Anti-Rattler, Joseph De Mars, San Francisco, Cal., assignor in part to Frank Minitree Johnson, Cheyenne, Wyo.; Anthony J. Walker, Niagara Falls, N. Y., and Arthur J. De Mars, San Francisco. A sash lock having a flanged casing with rock shaft journaled in the flanges, bent into two loops and provided with a stop projection adapted to engage the back of casing, and two flat spring indents. The free ends of the springs project in opposite directions and engage the edge of the sash.

Spark Plug, Joseph J. Lombardi, New York City. An electric ignition device comprising a hollow base portion and an insulating block fitted therein through which extends the electrode. The lower part of the shell has a circular opening and means are provided for raising or lowering the electrode to obtain the desired gap.

Vehicle Tire, Lewis Quintal, Cleveland, O. The device comprises two rims between which are interposed coiled springs resting in cup shaped members and means are provided for their retention and operation by adjustable bolts.

Lubricator, Ivert Larsen, Chicago. A lubricating device comprising a reservoir having a number of outlets, a rotary member for registering said outlets and a pump having a valve equipped piston for actuating the lubricant.

Spring Wheel, Herman M. Strawn, Marysville, Cal. A spring vehicle wheel having outer and inner rim members between which are fitted semi-circular springs which are retained by a device secured to the inner rim.

Motorcycle Handle, William F. Boast, Sterling, Col. A handle comprising a hollow grip of resilient material, having a coiled spring imbedded therein, and a block located in the outer end and engaging the springs.

Resilient Tire, Oscar H. Duckworth, Summerfield, Kan. A tire having a coiled spring formed into a series of convolutions and means for retaining spring and to provide for contraction and expansion.

Windshield, George F. Murphy, New Haven, Conn. A windshield for motor car service having curved forward members upon which the member is attached and operated, providing for different positions of the shield.

Wrench, Thomas J. Kennel, Middletown, O. A wrench having serrated jaws, also those of the usual construction. Means are provided for adjusting either set.

Spring Wheel, Robert Stock, Silver Creek, N. Y. A spring wheel having hollow spokes connecting the hub and rim, and main guide rods passing through openings in the rim and their inner ends within the spokes. Coiled springs are fitted inside the hollow spokes and auxiliary guide rods are incorporated between the ends of the springs and the outer rim. Other coiled springs are provided between the outer and inner rims.

Multi-Cylinder Engine, Samuel James McFarren, Pittsburg, Penn. A four-cycle gas engine having an uneven number of cylinders in two parallel groups, a shaft having oppositly set cranks, each of two said groups of cylinders being above a horizontal plane passed through the axis of said shaft. The pistons of the cylinders of one group are connected with one crank while those of the other group are attached to another shaft.

Spray Carburetor, Gottfried Plumm, Berlin, Germany. A carburetor having a revolving conical top with mixing mechanism and a porous nozzle pipe.

Expansible Piston, Edmond Van Bever, Watertown, Mass. A hollow shell piston, having inwardly extending bosses with wristpin fitted therein, and a shell portion integral with the piston body extending inwardly from said wristpin, said integral shell portion having a lengthwise extending slot and an external expander designed to expand inwardly extending shell portion.

Tire Tool, John H. Blake, Portland, Ore. A device for removing tires from rims, comprising a lever having teeth, a hook like lever carrying a pawl for engaging with said teeth and means for actuating same.

Induction Coil, John F. Cavanagh, assignor of three-fourths to the Lindsley & Allen Electric Company, Providence, R. I. An induction coil comprising a primary and secondary coil with condenser, and an interrupter constructed of a thin sheet metal disc having a continuous outer portion and provided with a spirally formed aperture through it whereby a flexible vibratory member is formed integral with the outer portion of said disc.

Motor Car Extricator, a device for extricating automobiles when stalled in mud, sand, etc. It comprises a windlass arrangement and means for securing same.

Calipers, Nicholas Helwig, Middletown, O. A caliper having a graduated beam on a screw threaded portion. One leg is mounted on the threaded portion and is moved and retained by a nut.

Headlight, William Churchill, Corning, N. Y. A headlight provided with a yellow glass screen adapted to be placed in or out of the path of the rays of light. Its object is to absorb all the blue and violet waves as well as those of the green of relatively shorter wave length.

Valve Lifter, George F. Clark, Daytona, Fla. The upper part of the device is hook shaped for holding valve head in place and attached to it is a chain. The lever member is provided with an L shaped part which hooks into the chain and is also fitted with a U shaped head for engaging the valve spring.

Tire Holder, John Clarence Cole, Chicopee Falls, Mass., assignor to the Fisk Rubber Company of the same place. A tire holder having three supports with adjustable jaws for gripping the inner periphery of the shoe and a locking device to tighten the grip of the members.

Cable Holder, James P. Holloway, Washington, D. C. A device for holding flexible cables, comprising a pair of rigid fingers and a clamp for securing holder.

Explosive Motor, William S. Lee, Detroit. The cylinder is provided with two bores and has a slidable valve sleeve with corresponding external diameters and a bore of a like number of diameters, and means for actuating sleeve.

Brazing Burner, William H. Van Horn, Baltimore, Md. The device includes a fuel chamber and means for conveying same to a jet nozzle and pilot burner. The latter is connected to the jet member by a separate passage and is provided with a number of outlets adapted to maintain the flame of the jet nozzle against extinguishment by the pressure of the gas. Means are also provided to regulate the flame as well as to shut off the supply of fuel to the burner.

Motor Starter, Myron T. Baird, St. Louis, Mo. An explosive mixture is led by tubing to each cylinder of the internal combustion engine. The vapor is distributed by means of a rotating mechanism driven by belt and a push rod is utilized to actuate the rotative member.

Expansion Reamer, Delano H. Dugar, Milwaukee, Wis. An expansion reamer comprising a longitudinally channelled body, a bolt swivelled to one end thereof, a set of blades and means for adjusting and securing the latter.

Battery Cell Container, Thomas A. Edison, Llewellyn Park, N. J., assignor to the Edison Storage Battery Company, Orange, N. J. A container for battery cells, comprising a frame adapted to stand upon a supporting surface, and means for supporting a plurality of cells out of contact with each other, and for preventing lateral movement of same relative to the frame.

DEVICES THAT DETECT INEFFICIENCY.

Additional Information Relative to Revealing Misuse of Pleasure and Commercial Vehicles---Outlining Particularly the Protection Afforded the Owner.

PREVIOUS consideration of the subject of recording devices for watching the movement of the motor vehicle when not accompanied by the owner, took up certain phases of the situation, and the illustrations were such as would tend to bring out the application of this factor to the commercial vehicle side. Mention was made of the fact that these instruments were designed for use with the so-called pleasure car, but it so happened that the charts presented laid rather more stress upon the possibility of their use for strictly business purposes.

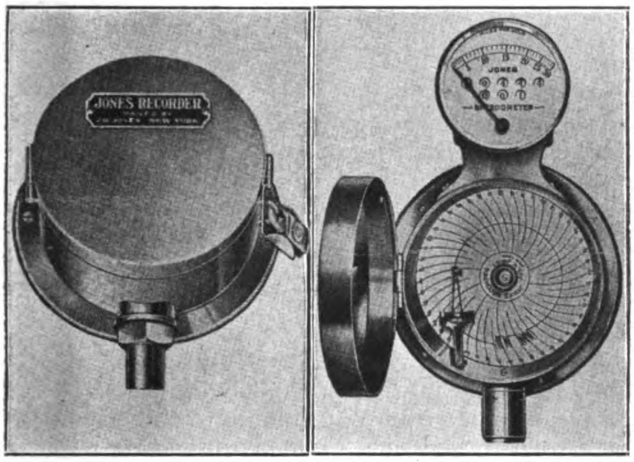


Fig. 5—Front and Rear of Jones Recorder, with and Without Speedometer.

An effort will be made herein to discuss still other phases of the problem, and if the illustrations and the arguments appear to indicate that the devices selected for description are particularly applicable to the pleasure vehicle side it should not be taken to mean that they are not also of special advantage to the owner of a motor truck. The point which the writer desires to make is that all the instruments illustrated and described during the consideration of this subject are equally applicable to all types of automobiles. It has been deemed best, however, to indicate certain needs of the business man, pleasure car owner and garage man, and the efforts that have been made to solve the difficulties presented.

There is at least one problem in which the garage proprietor is deeply interested. It was touched upon in a previous installment. While it is true that no garage can be held responsible for the improper use of the car, there is bound to be more or less unpleasantness if it so happens that the machine is turned over to the chauffeur without the owner's knowledge, particularly when the result is what has come to be termed a "joy ride." Any device or any method which will tend to eliminate this possibility is bound to receive careful attention from the garage man.

It is not claimed that the recording device will entirely solve this problem, but it may be indicated that by its use the owner is enabled to keep a strict watch upon his chauffeur and his property. If at any time he discovers any suspicious circumstance he is in a position to determine for himself whether or not there is danger of more serious consequences and to take such steps as good judgment would dictate.

The garage proprietor cannot be expected to assume the responsibility for any or all of the machines in his care. He is selling service, not conducting a detective bureau. He tries to protect the owner by arranging to deliver the car only upon order, but further than that he cannot go with reason. It remains for the owner to protect himself, particularly when it is possible to do so by the installation of simple and inexpensive precautions.

To illustrate this point, reference may be had to Fig. 5, which presents the Jones recorder, manufactured by the Jones Speedometer Company, New York City. This is shown both with and without the speedometer attachment and in both front and rear views. The company also produces a hub odometer, which registers the mileage, either forward or backward. The recorder, however, is designed to supply a complete and accurate history of the vehicle's performance every minute of the 24 hours and is equally applicable to pleasure and commercial cars.

The instrument is enclosed in a heavy brass case and may be attached to the dash or any other convenient part of the car. It is connected by a flexible shaft and gears to the front wheel, in exactly the same manner as the Jones speedometer is fitted. A marking stylus travels over a chart of sensitized paper, which cannot be tampered with and which gives a permanent record of the vehicle's movements at all times.

One of these charts is shown at Fig. 7, and in explanation it may be said that when the car is standing this chart is constantly travelling under the marking stylus, the record of the stop being shown by the continuous line. The length of this line indicates the duration of the stop. The running time is recorded by cross or zigzag lines, each one of which denotes a half-mile of travel. The speed of the run is calculated by counting the number of zigzag lines in a given period of time.

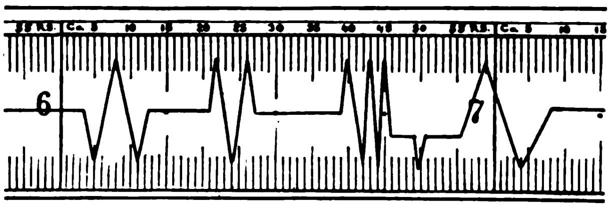


Fig. 6—Portion of Sample Speedograph Chart.

With one of these recorders attached to the car, the owner always is in a position to tell the start, stops and duration, mileage between stops, speed at all times, and the time of returning to the garage. Inasmuch as the case is locked, and no one can have access to the record except the party who holds the key, the company maintains that the owner is in possession of even more accurate information than would be possible if the car were accompanied by a private detective.

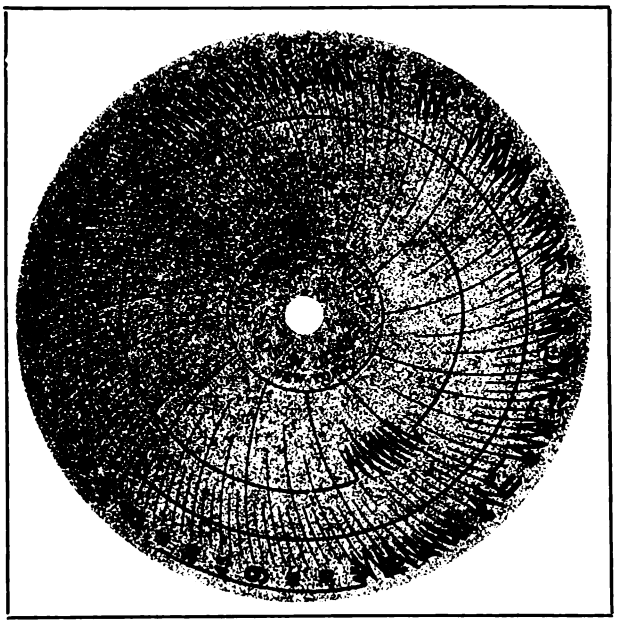


Fig. 7—Sample Jones Recorder Chart, Indicating Characacter of Permanent Record.

If it should transpire, for instance, that the chauffeur was in the habit of utilizing the machine for his own pleasure without authorization, this fact would be made apparent from study of the chart at the end the day. The owner, therefore, must have knowledge of any lapse of duty, and is able to forestall the possibility of the more serious "joy ride."

This is but one of the many ways in which the recorder may be utilized to advantage. In fact, it may be stated that the objects of this device are the same as may be applied to all of those described heretofore, and any of those may be employed as indicated of the Jones.

Referring again to Fig. 7, this chart was put on at 8:15 and the vehicle was running as follows: 9:45 to 10:37, 9.5 miles; 10:45 to 11, three miles; 11:15 to 11:37, four miles; 11:45 to 12:05, 2.75 miles; 12:15 to 12:35, 4.25 miles; 12:47 to 1:15, five miles; 1:20 to 2, 7.25 miles; 2:15 to 2:35, three miles; 2:45 to 2:55, two miles; 3:05 to 3:22, 3.5 miles; 3:33 to 4:50, 14.5 miles; 5:30 to 5:35, 3.25 miles. There were 12 stops. The car was out of service for 16.5 hours and then ran again from 10:15 to 11:08, 9.25 miles. The chart was removed at 2 with a total run of 71.25 miles. The average speed was 11 miles an hour. The running time was six hours and 25 minutes.

Still another device of this character is the Speedograph, made by the Recording Speedometer Company, 54 Clinton street, Newark, N. J., and illustrated, both opened and closed, at Fig. 8. It will be noted that this is a combination speedometer and service recorder, the former being located in the bottom portion of the case and connected by a set of gears with the actuating mechanism at the top.

When closed all parts of the Speedograph are securely locked against anyone not in possession of the key. It is maintained by the maker that there is absolutely no way in which the actuating needle can be tampered with or the gear be thrown out of engagement. In this manner the owner always is assured of an accurate record of the vehicle's movements. It is designed to check the time the car leaves the garage or any given point, as well as of the return, every stop made and its duration, the total number of miles travelled, the speed and variations in speed during the trip, etc. It readily will be seen that it may be employed in the same manner as the other devices presented.

Fig. 6 depicts a portion of one day's record, and in explanation it should be stated that the vertical lines indicate the vehicle was moving, while horizontal lines show that it was idle. The tape is divided into minutes, and is moved past the pencil point from one spindle to the other at the rate of three inches an hour, this being timed accurately by clock work. The pencil point travels up and down three-quarters of an inch for each half-mile, and is operated by the wheel of the vehicle.

The above record shows that the car started at 6:03 and was run 1.5 miles at the rate of 10 miles an hour, or one mile in six minutes. From 6:12 until 6:21 the vehicle was standing. From 6:21 to 6:27 it ran 1.5 miles at the rate of 15 miles an hour, or one mile in four minutes. From 6:27 to 6:39 it was standing. From 6:39 to 6:42 it moved at the rate of 15 miles an hour for three-quarters of a mile, then at the rate of 30 miles an hour for 1.675 miles. At 6:46 it stopped three minutes, then ran one-quarter of a mile at a 10-mile rate; stopped five minutes; ran 1.75 miles at the rate of six miles an hour, or one mile in 10 minutes, and stopped again at 7:08. Thus the

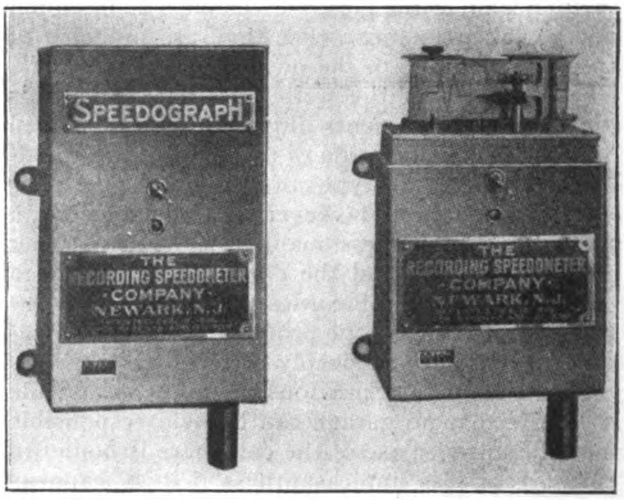

SPEEDOGRAPH
THE RECORDING SPEEDOMETER COMPANY NEWARK, N.J.
THE RECORDING SPEEDOMETER COMPANY NEWARK, N.J.

Fig. 8—Speedograph Opened and Closed, Showing Recording Pencil Making Record on Chart.

record might go on for the entire day, giving the owner opportunity to follow its movements all of the time.

Another maker of hub odometers is the Veeder Manufacturing Company, Hartford, Conn. These differ from the recorders, in that there is no chart, the main object being to disclose the mileage obtained from the car under all conditions. Additional details are possible of computation, however, and the maker states that a reading of the register will give the owner all the essential information of this nature.

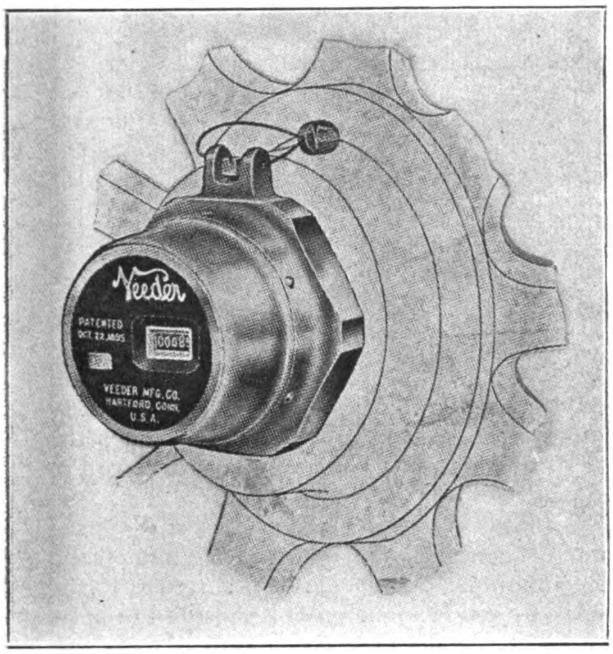


Fig. 9—Veeder Hub Odometer Sealed in Place on Hub.

The Veeder hub odometer, which is illustrated at Figs. 9 and 10, the former showing the instrument in place on the hub and the latter the internal mechanism, is of exceptional value to taxicab owners, although, as indicated above, it is equally applicable to all forms of vehicles. It is obvious that with an exact record of the mileage available at all times, the owner is in possession of data which will aid materially in computing costs of motor haulage, for instance.

A small spur gear is used to drive the odometer. A shank on the side of this gear is inserted in a hole in the end of the axle. The cotter pin which locks the nut passes through this shank and prevents the gear from turning or becoming loose. This gear meshes with a second gear inside the cap as seen in Fig. 10, and suitable mechanism drives the register always in the same direction, so that the entire distance travelled by the car, whether forward or backward, is recorded.

It is maintained that there is no way to take the instrument off except by unscrewing it from the hub. This can be done only after the set screw, shown in Fig. 9, has been withdrawn sufficiently to permit the cap to be turned, an operation that cannot be accomplished without first breaking the seal. This seal is the same in form as that which has been used for many years by railroad people and is held absolutely to prevent tampering with the odometer without being detected.

As has been explained the odometer is designed so as to record the distance travelled, no matter whether the car is going forward or backward, so that it is impossible for the driver to subtract mileage by jacking up the wheel and running it backward. It is held that there is no way to disconnect the mechanism by slipping the gears out of mesh.

FUTURE OF RUBBER MARKET.

The United States Rubber Company now has 80,000 acres of land in Sumatra planted in rubber trees, some 2,500,000 trees being set out, and already the prospects of the investment are held to be extremely promising. It is predicted that in time the company will be rendered independent of the open market, except for the finest Para. The oldest of the trees planted are now between two and three years old and as best results are obtained only by tapping trees not less than five years old, it will be two or three years before rubber from that source is expected.

It has been figured by some that when the trees begin to yield fully, there will be a saving equal to 4 per cent. on the common stock, basing this figure on an estimated output of 5,000,000 pounds from the plantations. Even the production of 1,000,000 pounds would mean an addition of a full 1 per cent. on the $25,000,000 United States rubber common, taking the value of crude rubber at $1 a pound, and estimating that it will cost the company 50 cents a pound to produce it in the plantation

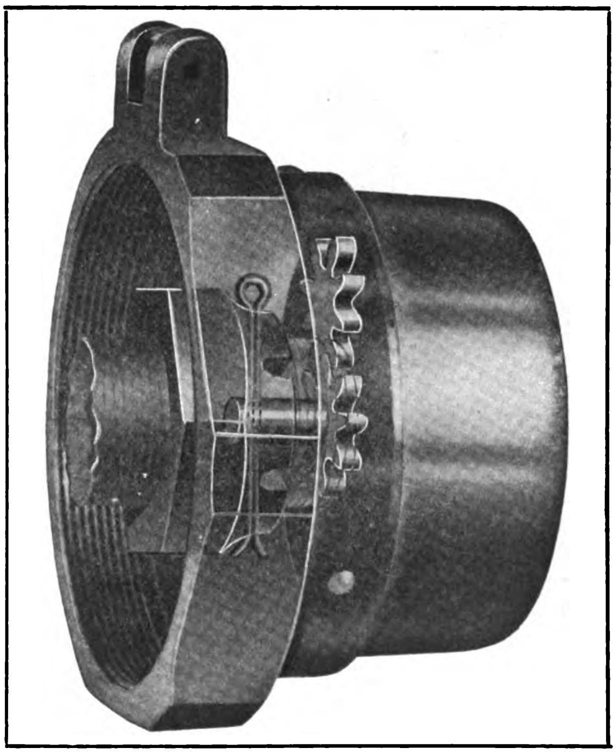
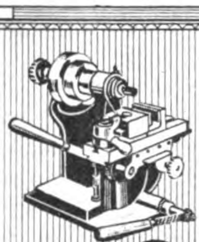
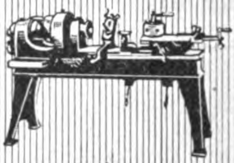


Fig. 10—Shadow View of Hub Odometer, Showing Operating Mechanism.



Up-To-Date Shop & Garage Equipment



WAYNE SIDEWALK FUEL PUMP.

Proprietors of some garages complain that there is no money in selling gasoline, stating that the profits are consumed by the cost of service and shrinkage. This does not apply to the concerns which are equipped with modern appliances. The small garage that makes it a practise to draw five gallons at a time from a tank and carry it as well as the funnel to the car, is losing the services of an employee. With the modern facilities for handling gasoline there is no reason why good money should not be made by selling fuel.

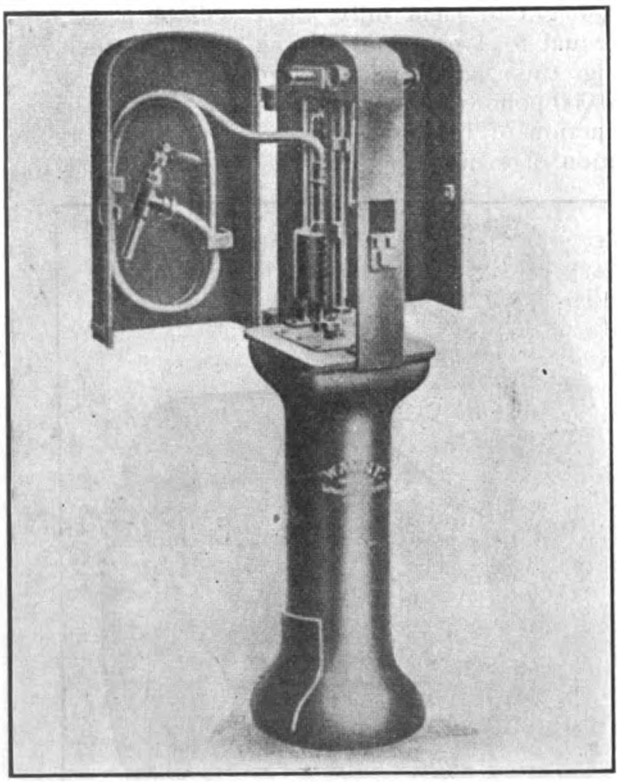


Fig. 1—The Wayne Sidewalk Gasoline Pump, an Equipment Making for Convenience.

Considerable improvement is noted in labor as well as time saving appliances for handling gasoline, and at Fig. 1 is shown the Wayne sidewalk pump, manufactured by the Wayne Oil Tank & Pump Company, Fort Wayne, Ind. It will appeal to the retailer in that it may be installed at the edge of the sidewalk, as well as in the garage, and in addition to being a practical equipment presents an attractive appearance to the passing motorist. Among its qualities is that its components are completely enclosed and locked by a spring lock, preventing its use by persons not possessing a key. This enables the owner of the garage to keep an accurate record of all gasoline sold or utilized.

The pump consists of a substantially made cabinet of cast iron finished in red enamel and black trimmings. The pedestal is fastened to the sidewalk by four expansion bolts inside the base. The cabinet is 4.5 feet high, overall dimensions, and occupies a ground space of about 18 inches square. Doors are provided on either side. The handle for pumping is located on one side and the hose and portable nozzle on the other. The pump is a specially designed one-gallon measuring member and is adjustable to measure a half-gallon or a quart at one stroke. The measuring device is enclosed in the housing at the top and cannot be tampered with. The pump is equipped with a 10-gallon discharge register and a 10,000-gallon worm gear meter which registers a cumulative record of all fuel drawn. There is also a dial to measure the fuel by quarts, if desired.

The outfit is equipped with a seven-foot length of special gasoline hose and a portable filling nozzle. When desired the pump may also be equipped with a special filter for removing water. The equipment may be utilized with any sized tank and may be employed with another pump located inside the garage. Economy of time is effected as the automobile is stopped beside the pump and the nozzle inserted in the tank. It also saves registering the car upon the garage record, which is required in some states.

ADJUSTABLE DIES AND HOLDERS.

Screw cutting dies form a valuable addition to the equipment of the repair shop and modern shop practise demands of all tools that they do their work quickly and well, that their form be such that they can be sharpened easily and that they cut as true at the end of a year's use as at its beginning.

The Remington Tool & Machine Company, Boston, is manufacturing a screw cutting die which is adjustable and possesses the quality of being easily accessible for sharpening or repair. The tool, which is shown at Fig. 2B, is constructed in two parts with a heavy rigid hinge formed integral with one side.

It is claimed by the maker that the die may be resharpened so long as any appreciable portion of the teeth remains, and that its life is from five to 10 times that of ordinary members. The taper hole at the top provides for the reception of the tapered point of the adjusting screw on the elastic die holder shown at D. Adjustment for expanding or contracting the die is accomplished without its removal from the holder. It is also pointed out that the hinge and taper point practically make a solid die when placed in the holder.

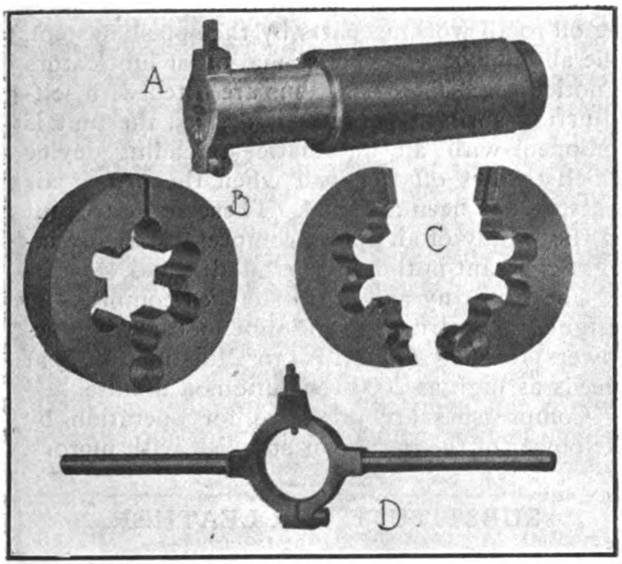


Fig. 2—Useful Tools for the Shop Equipment: A, Remington Screw Holder Adapted to Lathe Work; B, Adjustable Screw Cutting Die; C, Showing Assembly of Member; D, Elastic Die Holder.

The die is ground to a perfect cutting edge after tempering and is so designed that there is ample clearance for an emery wheel or lapping with diamond powder. It is also stated that particles of metal lodging between the teeth of the die are removed easily and that alignment is secured by reason of the sharp cutting teeth. The screw lead is properly maintained and a single cut is stated to make a perfect thread.

For bench work the die is utilized with the elastic or ordinary holders, but for machine work the member shown at A is recommended by the maker. The dies are constructed to cut U. S., V, Whitworth or Acme standard thread. They are made in diameters varying from .25 to four inches, and pitches from 20 to four, according to the style of thread. The best of material and workmanship are incorporated. Edgar T. Ward & Sons, Boston, is selling agent.

QUICK OPENING TIRE KETTLE.

The tire repair shop which averages two retreaded casings a day is the exception rather than the rule. It is now unnecessary for a concern doing this amount of retreading to install a large vulcanizer and kettle which require valuable space and increase the investment. With a large kettle the repairman is apt to allow tires to accumulate until enough to fill the kettle are ready to cure. This often inconveniences the customer.

The Williams Foundry & Machine Company, Akron, O., maker of tire repair equipment, is marketing a new quick opening steel tire kettle which is shown at Fig. 3 and with it a retread can be cured with as little trouble as a sectional repair. The tires after being wrapped are placed in the kettle and the lid lowered by means of the hand wheel working the double acting screw. A bar is placed on one of the sockets on the lid and given a part turn so that the lugs on the cover extend under the projecting lugs cast on the body of the kettle. Steam is then turned on and this brings the special wedge shaped packing into play, effectually sealing the joint.

When the cure is completed the inlet valve is closed and the steam blown off. The lid is given a part turn as before so as to free its lugs from those on the body of the kettle, and raised about four inches by means of the hand wheel. The crane and lid are then swung to one side, leaving the opening of the kettle entirely unobstructed. There is no overhead rigging and no possibility of the lid catching and injuring the operator.

The member is boltless and has sufficient capacity for all except the very largest shops. It measures 43.5 inches inside diameter in the clear and the curing space is 16 inches high above the bottom grating, making a capacity for about four tires, 42 inches or smaller. The kettle and lid are constructed of open hearth steel, tested with 200 pounds steam pressure, making it perfectly safe for any condition of service. The crane head handling device and bottom grating, which keeps the tires out of the water and permits steam to circulate all around the casings, are an improvement over the vertical kettle.

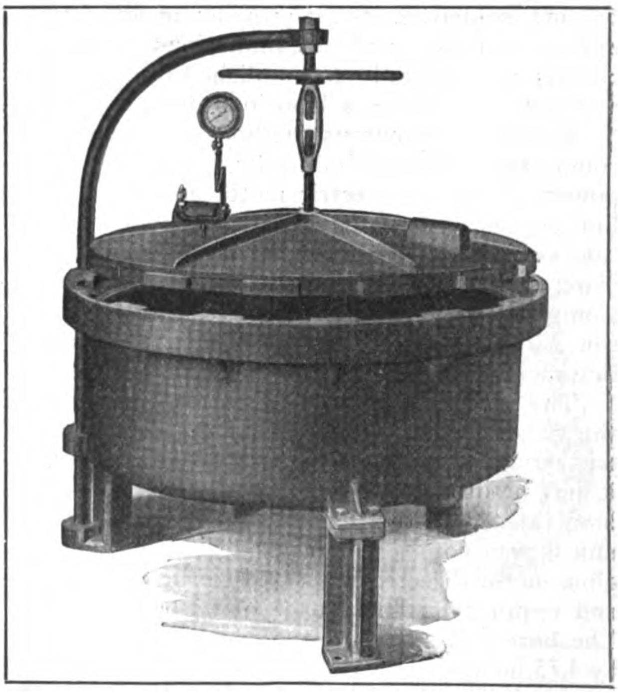


Fig. 3—The Williams Quick Opening Steel Tire Kettle.

The same concern is also manufacturing a tread rolling machine which is depicted at Fig. 4

and which is designed to replace the work of uniting the rubber and fabric by hand when tires are to be retreaded or new sections inserted. The maker also points out that the machine not only rolls the work properly, but it prevents air pockets and consequent blistering.

In operation the upper or concave roll is raised by means of a large hand wheel and the tire inserted between the rollers. The desired pressure is applied by screwing down the hand wheel. A heavy oil tempered steel spring below the lower convex roller insures even tension regardless of inequalities in the thickness of the casing. Turning the crank causes the tire to travel between the rollers which will work from one bead clear around the tread to the other. The rolling machine is constructed of high grade material.

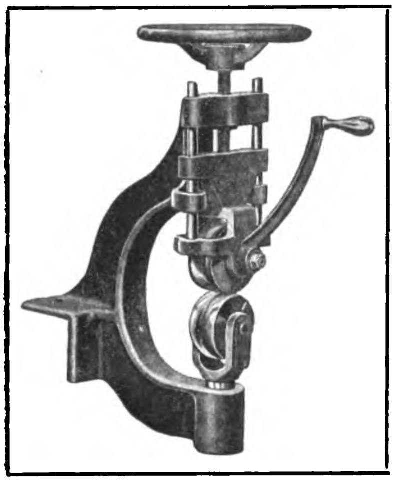


Fig. 4—The Williams Tread Rolling Machine.

THE CLAYTON AIR COMPRESSOR.

The air compressor has a wide range of utility, for in addition to being of service for inflating tires, cleaning upholstery, supplying air blast for brazing, soldering, etc., it provides means for removing grease and accumulations from the chassis, work usually accomplished by the brush and can of gasoline, a laborious operation.

There are numerous methods of driving the compressor, these including by belt off the main power line, by an electric motor and by a gasoline engine, the design depending upon the garage equipment. In order to comply with the varying conditions the International Steam Pump Company, New York City, successor to the Clayton Air Compressor Works, is manufacturing a line including the types outlined above.

The unit illustrated at Fig. 5 is designed for the garage outside the zone of the central electric service station and one of its qualities is that it may be utilized when the power of the shop is inoperative and the tank requires refilling. The unit is very compact, comprising as it does a gasoline motor directly connected to the compressor and requiring a floor space of 22 by 27 inches. The bore and stroke of the compressor are 4.75 by 4.75 inches and it is designed to operate at 125 pounds pressure, the company maintaining that an excess of this amount is not adaptable for garage service owing to the danger of bursting of tires when utilized by the inexperienced or careless workman.

The compressor is driven at a speed of 240 revolutions a minute by a three horsepower standard motor and is of the water-cooled type, although the company makes a wide variety of both air and water-cooled members. The machine is constructed of high grade material and accessibility is a feature. It is self-lubricating, an oil reservoir in the bottom of frame base supplying oil to all working parts by the splash system. The absence of grease cups and other lubricators is noticeable. The air pistons are fitted with self-adjusting spring rings and if desired the unit is equipped with an automatic unloading device which throws off the load when the proper air pressure has been attained. These serve to shut off the supply of air to the compressor, maintaining it constant in the receiver at all times.

The company also manufactures compressors designed to be driven by gasoline motors of horsepowers ranging from 1.75 to 21.5 operating at speeds as high as 2000 revolutions a minute.

Compressors are produced for operation by the power of the garage or supplied with motors.

SUBSTITUTE FOR LEATHER.

According to Consul-General John L. Griffiths, London, England, a new material, Seagumite, has been discovered which may be employed as a substitute for rubber and leather belting. It is obtained by treating seaweed by a secret process which, it is stated, results in a totally non-inflammable, impervious, leather like, damp proof composition, unaffected by heat, cold, oils or exposure to the weather.

Its inventor expects it to be used as a substitute for rubber and leather in all climates, and its cost of production is very low. It possesses an unusual power of resistance to an electric current and trials made under severe conditions by electrical experts show that it withstood a test of 32,000 volts and that its insulating properties are greatly enhanced after immersion in water.

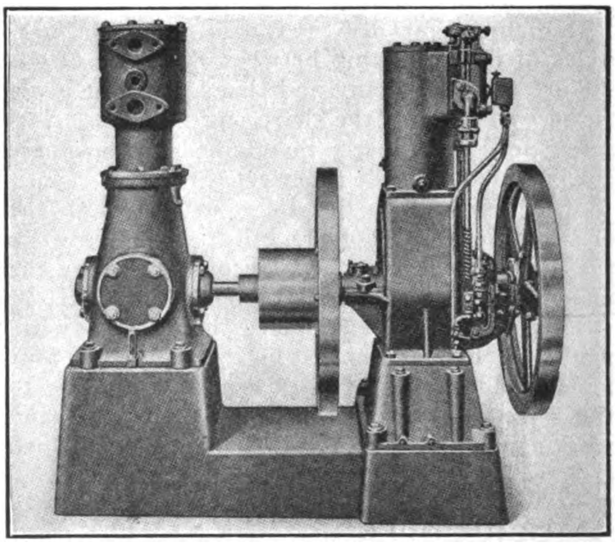


Fig. 5—The Clayton Air Compressor Operated by Gasoline Motor and Designed for Garages Beyond Zone of Central Electric Service Station.

FEATURES OF THE NEW STANWELD RIMS.

ANNOUNCEMENT is made by the Standard Welding Company of Cleveland, O., of its new line of automobile rims which will be marketed under the name of Stanweld. The new types are the result of much study and experimentation and are designed to meet the requirements of the motorist who desires to change the make of shoes and who wishes the quick detachable and quick demountable features incorporated. The rims are universal in that they will accept either a straight side or clincher casing.

To meet the demand for a quick detachable rim without the demountable feature, the company has designed three types of rims the only variation being the type of tire they will accept, these being known as Stanweld rim types 50, 51 and 52. The first named is a universal rim in that it has two removable side rings, one continuous and one split, both of which can be reversed and the rim utilized for a straight side or clincher tire. On the types 51 and 52, one straight or clincher side is made integral with the rim base, making for durability as well as minimum weight. Type 51 is for straight side tires only, while 52 is for clincher, although by using a rim filler on one side, and reversing the detachable ring, this type may be employed with straight side casings.

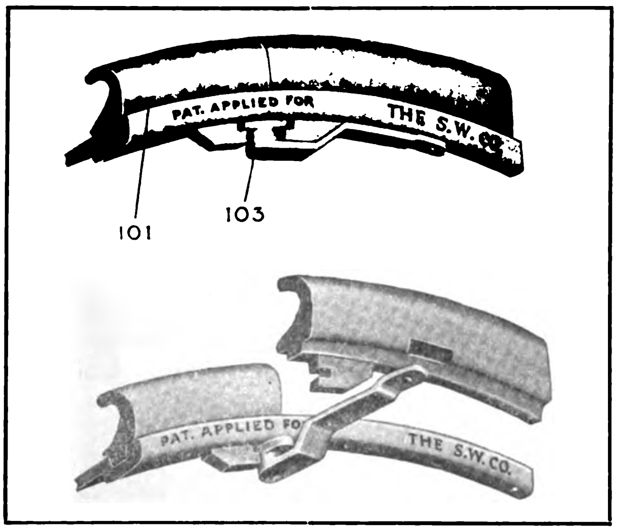


Fig. 4—The Stanweld Detaching Mechanism, a Positive Locking Device—The Upper View Shows Latch and Ring Locked.

A quality of the design is the detaching mechanism shown at Fig. 1. This side ring is split transversely and has slotted lugs on either end which protrude through slots in the rim base when the ring is in position. The latch is easily operated, being securely attached to the rim, and in normal position absolutely locks the ring to the base as depicted in the sketch. The ease of operation is shown at Fig. 2, the only tool required being a screw driver, which is inserted in a recess and given a slight upward pull, releasing a projection, after which it is a simple matter to swing out the latch and remove the split ring.

The demountable rims are known as types 30, 40, 41 and 42, and have the quick changing qualities of the rims just mentioned, but demountable features also are incorporated. These are simple and effective, comprising practically four parts, the rim base, adjusting ring, felloe band and clamping devices. The adjusting ring, which is depicted at Fig. 4, is a new feature, as it is split transversely, making for accurate centring and continuous bearing of the rim base on the felloe band. Its outer circumference is designed to fit the ledges on the rim base flanges in such manner that the rim base cannot move in a lateral direction, as the bevels of the rim base flanges and adjusting rings fit each other so that the weight of the car tends to force the rim in a direction towards the retaining flange of the felloe band. The continuous bearing of the retaining flange against the rear of the rim base prevents lateral movement in that direction. The maker points out that the construction relieves the clamping devices of all direct strain, as the pressure on the rim base transmits its greatest displacing force to the adjusting ring and towards the felloe band flange, the bolts assuming but a slight strain.

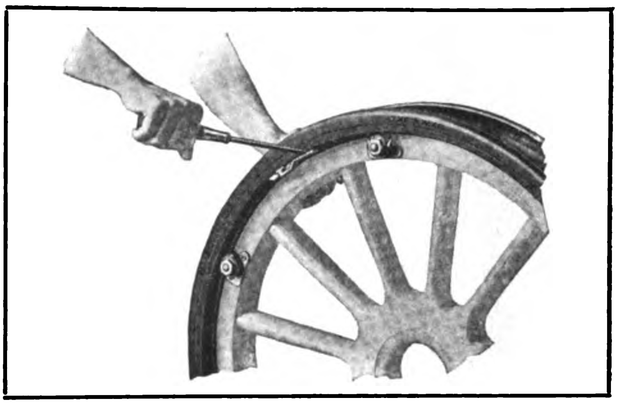


Fig. 2—Depicting Simple Operation of Releasing Latch from Lock—The Only Tool Required Is a Screw Driver.

The design is noticeable for simplicity and it is impossible for the wheelmaker to attach the felloe band in other than the proper location and the rim will run true with the wheel. A quality claimed of the adjusting ring is that it gives a contemporaneous radial expansion to the rim base at all points of its front and rear circumference, preventing wabbling and consequent tire expense. It is not necessary to carry a spare adjusting ring with each spare rim as the adjusting ring can be removed easily and quickly placed in the spare rim that is to be fitted.

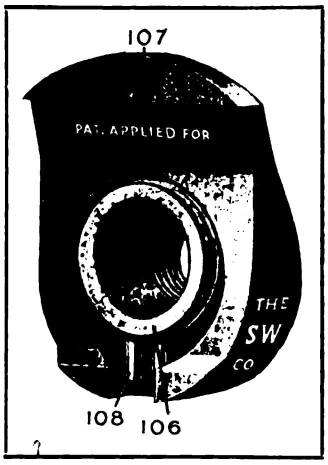


Fig. 3—Outlining Construction of Clamp Utilized with Demountable Rim.

To positively lock the rim base it is only necessary to hold the adjusting ring in a position between the rim base and felloe band. This is quickly and easily done by the utilization of six clamping bolts, placed equidistant.

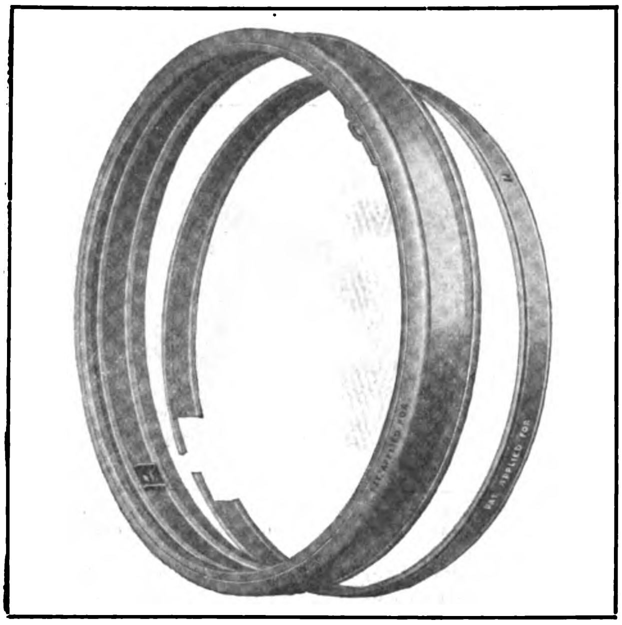


Fig. 4—The New Stanweld Adjusting Ring, Making for Accurate Centring and Continuous Bearing of Rim Base on Felloe Band.

The locking bolt is depicted at the right at Fig. 5 and comprises a bolt 105, which has a head made integral with it and which provides a support for the back flange of the felloe band; the clamp washer 109, which is secured to the front of the felloe with screws and the clamping device, which is an assembled piece consisting of a concave clamp 107, a conical clamp 106, and a friction spring. These parts are inseparable after being assembled and are designed to withstand severe usage.

The clamp when locked, bears upon both the adjusting ring and clamp washer. It has a universal movement on the conical clamp nut which provides for considerable variation in the position of the clamp, as well as prevents possible bending of the bolt through misalignment. Only a few turns of the conical clamp nut are necessary to release or tighten the clamp and during the operation the clamp turns with the nut, but only until the desired position is reached. The clamp washer has a projection which prevents the clamp from turning further. When the clamps are unlocked the rim base with its adjusting ring can be removed easily from the wheel. The clamps do not have to be tightened in a released position in removing the rim as the clamp nuts perform this work.

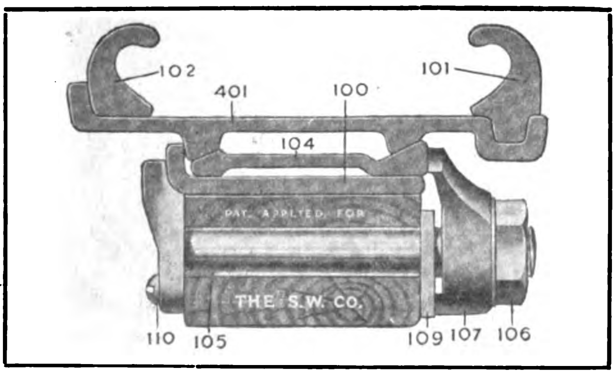


Fig. 5—Cross Sectional View of Demountable Rim Type 40, Showing Locking Bolt and Clamp.

All Stanweld demountable rims embody the quick detachable feature and are very light in weight as well as water tight, qualities making for efficient service. The demounting device comprises several wedges operating on bolts extending through the felloe. These wedges form a simple yet efficient method of retaining the rim base with its tire on the wheel. The rim is produced in both the straight side and clincher types and its simplicity and light weight may be cited among its more noticeable features.

All the demountable rims embody a quick detachable feature which is independent of the demountable design. In the event of a second or third puncture or blow-out it is not necessary to remove the entire rim to detach the tire, as this may be performed independently and without disturbing the demounting mechanism.

Type No. 30 differs considerably from the rims mentioned and is designed for those who desire a demountable rim of extremely light weight, yet sufficiently strong to withstand severe strains. It has a circumferentially locking rim, both sections of its base having tire gripping flanges integral with them. The abutting edges of these sections have inwardly projecting lugs which, when the rim is locked, are held securely together by means of rings of pressed steel slotted to accept the protruding lugs. The spring rims, of which there are only two, are riveted to one section of the rim base.

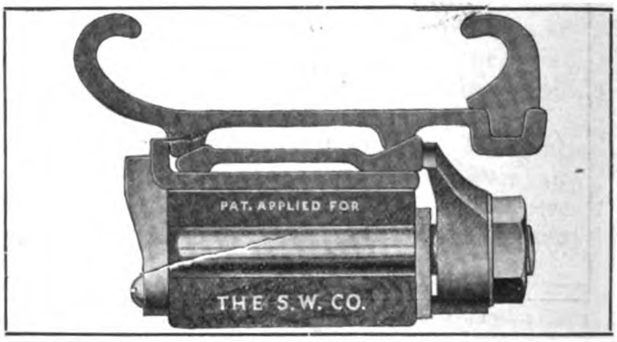
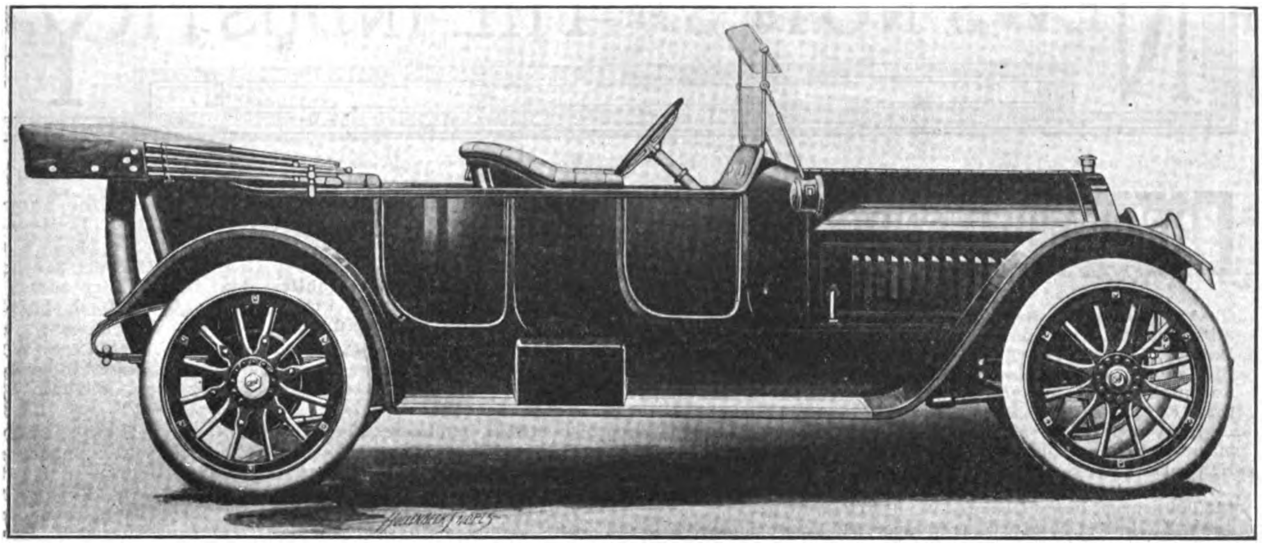


Fig. 6—Depicting Sectional View of Demountable Type.

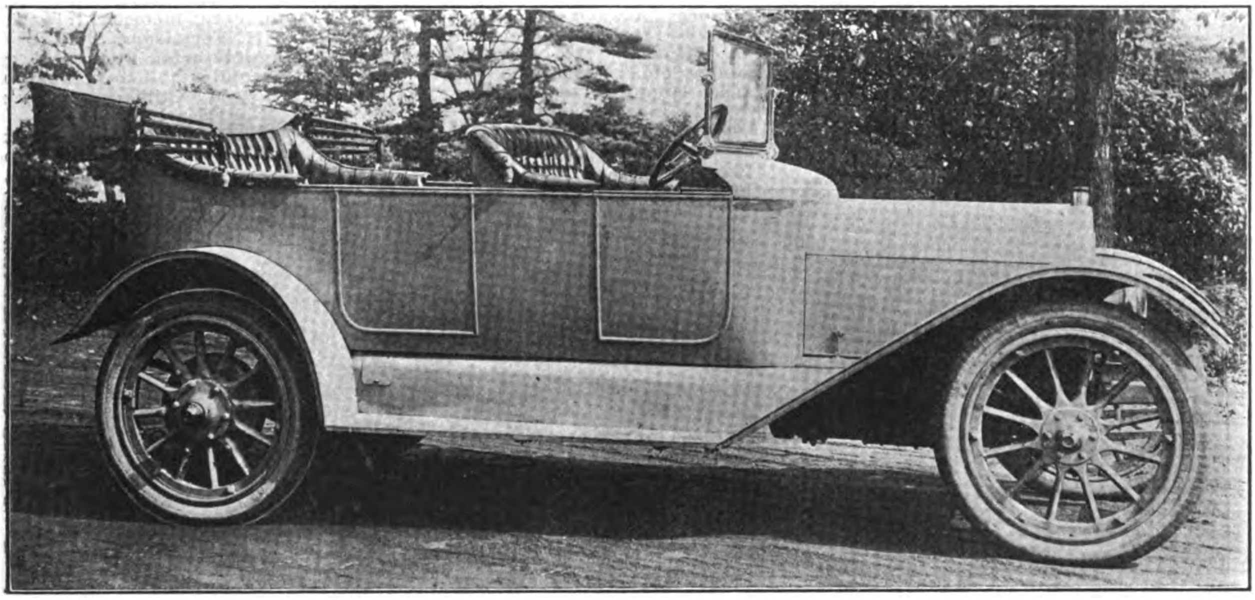
To detach a tire it is only necessary to loosen a retaining catch and pry up the ends of the spring rings. The two sections of the rim base are then separable. It is pointed out by the maker that there is absolutely no friction of parts to overcome in locking or unlocking the two sections as no circumferential movement of either is necessary.

The demounting device consists of several wedges operating on bolts extending through the felloe. These wedges form a simple yet efficient method of holding the rim base with its tire upon the wheel. The rim is produced in both the straight side and clincher types, and its simplicity and light weight may be cited as among its more noticeable features.

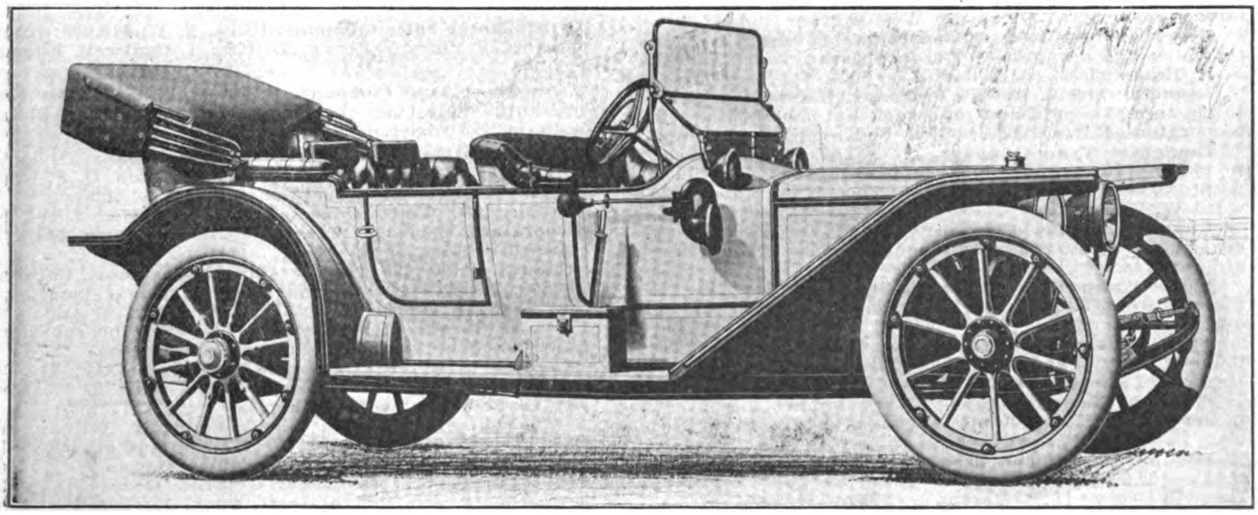
ATTRACTIVE NEW LINES FOR DEALERS.



New Cole Six-Cylinder "60," Manufactured by Cole Motor Car Company, Indianapolis, Ind., Price, $2485, Equipped.



Six-Cylinder, Five-Passenger Lenox, Manufactured by Lenox Motor Car Company, Boston, Mass., Price, $2750, Equipped.



American Traveller, 46 Horsepower, Manufactured by American Motors Company, Indianapolis, Ind., Price, $4500, Equipped.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

Auto Dispatch Bureau, New York; $25,000; to deal in automobiles; incorporators, Walter Stackhouse, Harold Parker, L. S. Parker.

Knickerbocker Havers Company, New York; $50,000; automobiles, motorcycles and motor vehicles; incorporators, E. M. Cravath, B. M. Crosthwaite, F. E. Grant.

Benton Motor Car Company, Benton, Ill.; $65,000; to manufacture automobiles and accessories; incorporators, H. Stotlar, W. S. Cantrell, A. H. Fraunfelder.

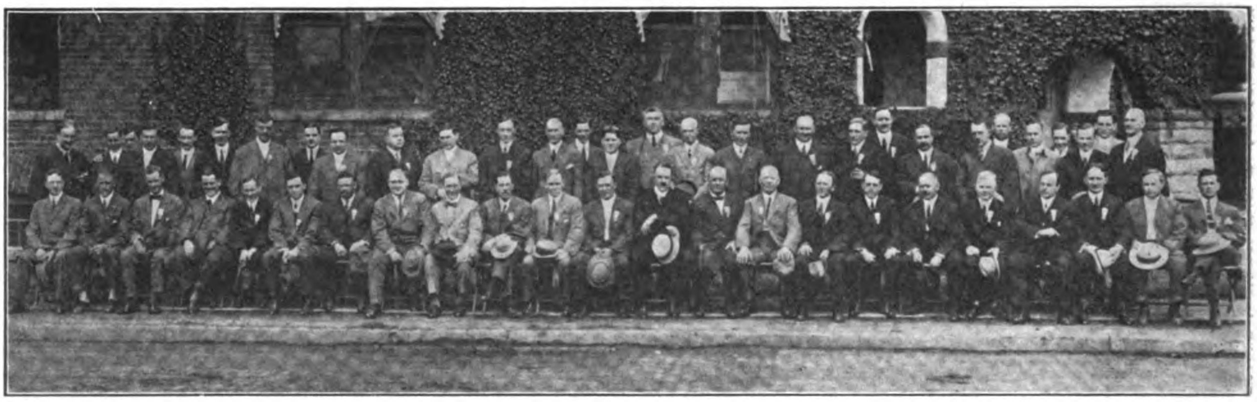
National Auto Top Company, Richmond, Va.; $5000 to $15,000; president, George W. B. Crawford; vice president, E. R. B. Crawford; treasurer, R. V. Merchant.

Mathiesen Spring Cushion Wheel Company, Augusta, Me.; $60,000; to deal in patented automobile wheels and tires; president, R. S. Buzzell; treasurer, L. J. Coleman.

The Ellis Car Company, Greenville, S. C.; $15,000; president, Charles W. Ellis; secretary and treasurer, A. G. Dale.

Gerhart Spring Tire Company, Marietta, O.; $15,000; to market vehicle wheel tires, wheels, automobiles, etc.; incorporators, J. A. Gerhart, G. O. Salzman, Casper Hopp, S. C. Molder, A. A. Schram.

Havoline Auto Company, Dallas, Tex.; $10,000; incorporators, F. W. White, Edwin Hobby, J. W. Crotty.



Group of Oakland Dealers and Salesmen at Recent Convention at the Oakland Motor Car Company's Factory in Pontiac, Mich.

Automobile Safety Fender Company, Rochester, N. Y.; $100,000; automobile appliances, etc.; incorporators, William A. Snyder, Jr., Abram De Wolf, Abram Bune.

People's Motor Sales Company, Skaneateles, N. Y.; automobiles and garage; $15,000; incorporators, J. L. Shultz, F. H. Humphries, A. J. Allen.

Economy Tire & Rubber Company, Harrisburg, Penn.; $5000; to make solid and pneumatic automobile tires; incorporators, Edward L. Craft, B. F. Knupp, E. M. Knupp.

Englebert Tyne Company, New York City; $100,000; to manufacture automobiles and motor vehicles; incorporators, Samuel K. Kellock, Clarence B. Campbell, Edward W. Elverson.

Imperial Garage Company, Dover, Del.; $25,000; to deal in and manufacture automobiles, construct and operate garages.

Lewis Automobile Company, St. Louis, Mo.; $16,000; incorporators, J. D. Perry Lewis, Walter H. McLean and others.

The Essenkay Empire Company, Albany, N. Y.; $10,000; to manufacture and deal in automobiles; incorporators, Herman C. Cowen, John G. Cumming, Howard Wilbur.

Standard Garage Company, Paterson, N. J.; $25,000; incorporators, Martin White, Susan B. White, Oscar Harris.

Hub Twenty-Second Street Garage Company, Camden, N. J.; $100,000; to conduct a garage; incorporators, F. R. Hansell, George H. B. Martin, I. C. Clow.

Reliance Speedometer Company, Portland, Me.; $100,000; incorporators, Charles M. Drummond, G. M. Horne, Wadleigh B. Drummond.

Lamay Manufacturing Company, Rochester, N. Y.; $25,000; to manufacture fire extinguishers for automobiles and motor boats; incorporators, Arthur B. Headley, Philip E. Tucker, Arthur C. Lamay.

Grafton Motor Company, Grafton, W. Va.; $5000; to repair and store automobiles, deal in and hire same; incorporators, Henry J. Pracht, H. D. Comerford, J. Howard Reynolds, A. R. Kunst, D. C. Peck.

New York Garage Association, New York City; $2000; to conduct general garage keepers' exchange; incorporators, Charles H. Potter, Louis J. Joscelyn, William Burrows.

Miller, Hicks & Hewitt, Inc., New York City; $10,000; automobile bodies, painting, trimming, etc.; incorporators, Harry D. Miller, Henry T. Hicks, George A. Hewitt.

Cameron-Rowe Auto Service, Inc., New York City; $10,000; to operate a motor car service station; incorporators, James Cameron, Norman Cameron, August T. Rowe.

Hunt & West, Inc., New York City; $10,000; to deal in motor cars; incorporators, Burton R. Law, John W. Collopy, Jr., Elly Z. Parker.

Mercedes-Daimler Selling Corporation, New York City; $50,000; to deal in motor cars; incorporators, A. M. Becker, John A. Lemline, E. H. Ferguson.

Western Auto Sales & Manufacturing Company, Omaha, Neb.; $50,000; to sell automobiles and to manufacture tops, covers, etc.; president, A. W. Gilman; vice president, A. W. Cole; secretary, M. M. Searles.

Jefferson Automobile Company, Peoria, Ill.; $30,000; to manufacture, repair and deal in automobiles and to operate a garage; incorporators, R. C. Uckena, Frank E. Howland, F. I. Archdale, W. C. Ronneberg, Cedric Howland.

Otis Motor Sales Company, Utica, N. Y.; $10,000; incorporators, T. Harvey Ferris, William T. Cantwell, Edward J. Otis.

Standard Auto Company, Paterson, N. J.; $2500; general automobile business; incorporators, Christian Braun, William F. Drexler, Henry Stoeher.

Co-Operative Auto Sales & Supply Company, Olympia, Wash.; $100,000; incorporators, H. F. Preston, G. F. Preston, W. A. Mentrum, F. A. Mentrum, M. S. Alder.

George H. Weller Company, St. Louis, Mo.; $5000; incorporators, George H. Weller, Sallie J. Brown, Mary S. Howard.

South Park Automobile Garage Company, Chicago; $25,000; general garage and livery business; incorporators, Herman Frank, Harry J. Lurrie, John A. Anderson.

Smith Garage, Hempstead, N. Y.; $2000; incorporators, Lawrence Schultz, Joseph Pensock and others.

S. Whyle Merritt Company, New York City; $10,000; to manufacture piston rings; incorporators, S. W. Merritt, Clyde V. Morse and others.

The Auto Service and Supply Company, Wilmington, Del.; $15,000; incorporators, F. A. Webb and others.

Rambler Distributing Company, Kansas City, Mo.; $10,000; incorporators, Edgar C. Ellis, George D. McIlrath, Roy K. Dietrich, Hale H. Cook, Raymond C. Barnett.

Marlinton Garage Company, Marlinton, W. Va.; $10,000; incorporators, F. T. McClintic, C. A. Yeager, M. E. Pue, G. R. Goodsell, L. S. Shoemaker, G. W. Cleak.

Bucksport Motor Company, Bucksport, Me.; $6000; incorporators, J. E. Witham, H. N. Churchill, H. E. Churchill.

T. F. Hahn Company, New York; $10,000; incorporators, Elizabeth Hahn, Jeanette A. Bravy, Charles Le Fevre.

W. D. C. Motor Car Company, Elizabeth and Newark, N. J.; $50,000; incorporators, Peter C. Walls, Walter E. Camping, William J. Drumplemann.

Taxicab Company, Charleston, W. Va.; $5000; to deal in and repair automobiles and other vehicles; incorporators, F. J. Hill, F. A. McGrew, R. C. Lanham, J. H. Love, G. A. Denz.

Buffalo Resilio Company, Buffalo, N. Y.; $25,000; to manufacture tires for motor vehicles; incorporators, Stafford D. Noble, Alexander D. Falack, Philip E. Lonergan.

Excelsior Automobile Company, Elizabeth, N. J.; $50,000; general automobile business; incorporators, Patrick H. McGann, Cade Raiemes, Peter Kern.

Holland, Donnelly Company, Atlantic City, N. J.; $100,000; general automobile business; incorporators, Edwin J. Holland, Edwin R. Donnelly, Harry L. Gilberson.

Continental Motor Corporation, Buffalo, N. Y.; $100,000; to manufacture motor parts and accessories; incorporators, Gordon F. Matthews, Frank V. Wayland, Allen E. Choate, Walter Schmieding and R. L. Hurd.

Schillo Motor Sales Company, Chicago; $15,000; to manufacture and deal in automobiles and accessories; incorporators, Leonard Lorimer, E. W. Schillo, Albert G. Schillo.

The Kosmak Electric Company, Jersey City, N. J.; to manufacture electric horns and signals for automobiles, electric batteries, etc.; $10,000; incorporators, J. R. Cubit, W. Kosinski, M. J. Curris, A. Curris, J. R. Mack.

John R. Price, Inc., Newark, N. J.; $100,000; to manufacture gasoline engines, machinery, etc.; incorporators, John R. Price, George W. Knorr, Hannah E. Price.

Auto Lighting Corporation of America, Norfolk, Va.; $400,000 to $1,500,000; president, A. D. Newcomb; vice president, Wailes Hank; secretary and treasurer, W. J. Simpson, Jr.

WITH THE MANUFACTURER

The Cole Motor Car Company, Indianapolis, Ind., maker of Cole cars, has closed the following contracts with agents for 1913: Robertson Tire & Auto Company, Birmingham, Ala.; Fred E. Koch, Burlington, Ia.; Barton-Ford Motor Company, Cedar Rapids, Ia.; W. H. Gulland, & Co., Clarion, Penn.; Wallace Bros., Clearfield, Wis.; Tanbert Auto Company, Eau Claire, Wis.; Daniel Statter & Co., Johnstown, Penn.; Richardson Bros. Garage, Naugatuck, Conn.; Arthur M. King, Niagara Falls, N. Y.; Isham J. Dorsey, Opolika, Ala.; Pontiac Motor Car Company, Pontiac, Ill.; S. L. Bradley & Co., Princeton, Ill.; Fred Carlson, Rockford, Ill.; Welch Bros., Tekamah, Neb.; Thurman Motor Car Company, Thurman, Ga.; West Liberty Auto Company, West Liberty, Ia.; William Scheffer, Williamsport, Penn.; Backdahl & Co., Stockholm, Sweden.

The Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, is to establish a branch on Hennepin avenue, Minneapolis, Minn. J. W. Martin will be manager and will carry a full line of repair parts for all models.

The Haynes Automobile Company, Kokomo, Ind., maker of Haynes cars, has opened a branch in a new building at 1702 Grand avenue, Kansas City, Mo. The new company will be known as the Kansas City Haynes Company.

The R-C-H Corporation, Detroit, has closed 1913 contracts for R-C-H's as follows: I. D. Lundy Company, Seattle, Wash.; Crisler & Co., Rice Lake, Wis.; The Smith Agency, Bradford, Penn.; J. E. Brown, Temple, Tex.; O. L. Cottingham, Pekin, Ill.; Lambert Morin Motor Vehicle Company, Lawrence, Mass.; Frank Johnson, Coatsville, Ind.; L. S. Rudy, Cheyenne, N. D.; B. C. Barry, Santa Barbara, Cal.; O. C. Drew, Jr., Atlanta, Ga.; Edward F. Cushion, Claremont, N. H.; H. E. Shaw, Greenfield, Mass.; William V. Little, Miami, Fla.; E. W. K'Burg, Toledo, O.; Carmine Coccari, Monessen, Penn.; E. F. Walker, San Marcos, Tex.; J. W. Paulen, Fredonia, Kan.; Palmer Auto & Supply Company, Maquoketa, Ia.; William Konow, Chicago Heights, Ill.; A. D. Barton, Cythiana, Ind.; Woodworth Bros., Newton Highlands, Mass.

The Hudson Motor Car Company, Detroit, maker of the Hudson cars, has greatly increased its factory space to conform with the growing demand for its product. Two new factories have been added, instead of one, as was originally contracted for by the company. A year ago the Hudson factories' floor space was 172,811 square feet. The plant has since been doubled in size, the new additions bringing the total to 363,311 square feet.

Frank and Perry Remy, formerly owners of the Remy Electric Company, Anderson, Ind., who sold their interests in the concern two years ago, are preparing to enter the field again and develop several patents which it is said have recently been granted to them.

The Lozier Motor Company, Detroit, manufacturer of the Lozier cars, has leased from the B. F. Goodrich Company, New York, the eight-story building at 227 West 57th street, New York. The Lozier company also reports that the five-story building which it now occupies at the northwest corner of Broadway and 56th street, has been leased for a long term of years to the Overland Sales Company, New York.

John H. Ashton, Trenton, N. J., has started the 1913 season in a newly equipped garage and salesroom.

Illinois Automobile Company, with headquarters at Chicago, is a new company surrounded by familiar faces in the automobile industry of the Windy City. The officers are: President, W. G. Benner; vice president, R. B. Holt; secretary and treasurer, E. H. Marhoefer; sales manager, D. E. Northam.

The Prest-O-Lite Company, Indianapolis, has moved its Detroit branch into a spacious new service station, with ample room for the storage of a large number of tanks as well as a department for adjusting Prest-O-Lite starters and lighters.

The Baker Bros. Motor Company, Buffalo, N. Y., distributor in western New York for the Cole car, made by the Cole Motor Car Company, Indianapolis, Ind., has opened new salesrooms at 1227-1229 Main street. The firm will in future be known as the Cole Motor Company.

Carroll A. Haines & Co., Baker electric distributor in Philadelphia, has moved into new and larger salesrooms at 1927 Market street.

William Wenkenbach Sons, Philadelphia, is erecting two buildings, in which it will manufacture bodies for motor trucks. H. Albert Wenkenbach is president and F. D. Klein is superintendent of the company.

The Ohio Motor Sales Company, Pittsburg, Penn., will in future represent the Ohio car, manufactured by the Ohio Motor Car Company, Cincinnati, O., in that territory. Temporary quarters have been obtained at 5712 Penn avenue pending the completion of the company's new salesroom and service station. The Ohio's new Pittsburg dealer succeeds the Federal Motor Car Company, which formerly represented that line.

John W. Hayden, Chicago, will act as special agent in Chicago and vicinity for the Nyberg cars, made by the Nyberg Automobile Works, Anderson, Ind. Until recently Mr. Hayden had been manager of the United Motors Indianapolis branch for three years, previous to which he had been for six years manager of the Chicago branch of the National Motor Vehicle Company, Indianapolis, being the first agent in the employ of that concern.

W. L. Hunsucker, for two years an aggressive and successful automobile salesman of Oakland, Cal., and for the past year connected with the sales force of the Pioneer Automobile Company, has been appointed manager of the Oakland branch of the American Motors Company of California and also of the Marion Motor Car Company. Mr. Hunsucker had been temporarily in charge of the interests of both firms and his appointment makes his office permanent.

Alfred Measure of the Cadillac Automobile Company, Boston, in preparation for the marketing of the 1913 Cadillac made by the Cadillac Motor Car Company, Detroit, has reorganized his sales staff, adding Fred H. Lucas, for many years prominent in the carriage trade; Theodore A. Earle, Edward Becker, C. J. Bailey and C. W. Cole.

J. A. Strelinger, a Detroit boy, who has been working for a number of years on a magneto dynamotor for lighting and starting, is attempting to interest the automobile manufacturers of that city in his perfected device.

The Vanguard Manufacturing Company, Joliet, Ill., is soon to remove its office and factory force to Detroit, where the new plant will be completed in the near future.

N. Bates Ackley, assistant auditor and for 27 years in the employ of the Michigan Central Railroad Company, has joined the Studebaker Corporation's automobile division as assistant treasurer and will be in charge of the finances of the big Studebaker plants at Detroit.

C. E. Havens has resigned as manager of the technical and service departments of the Abbott Motor Company, Detroit, maker of the Abbott-Detroit cars, and is taking an extended vacation in the northern Michigan woods for his health. Mr. Havens was for many years technical manager of the Hudson Motor Car Company, Detroit, maker of the Hudson cars, before joining the Abbott company. He expects to join a new concern in the course of a few months.

The Dominion Stamping Company, Ltd., has erected a large forge shop at Walkerville, Ont., and is installing machinery. The company is capitalized at $250,000 and the new plant will be in operation in the near future. The factory will be one of the largest in Canada and contracts have been closed with a number of automobile manufacturing concerns in the United States and Canada, covering their 1913 requirements.

The New York Lubricating Oil Company has found it necessary to open new and larger quarters in San Francisco owing to the immense increase in the sales of Monogram oil on the Pacific Coast In addition the company has opened an office at Spokane, Wash., at Lincoln and Railroad avenues.

The Chalmers Motor Company, Detroit, has voted to increase the capital stock from $3,000,000 to $5,000,000. Of this amount $1,000,000 was paid in stock dividends to the stockholders and the other $1,000,000 was placed in the treasury for future use.

The Stuyvesant Motor Car Company, Sandusky, O., is to erect a new factory at Benton, Mo. The contract for a large building already has been let.

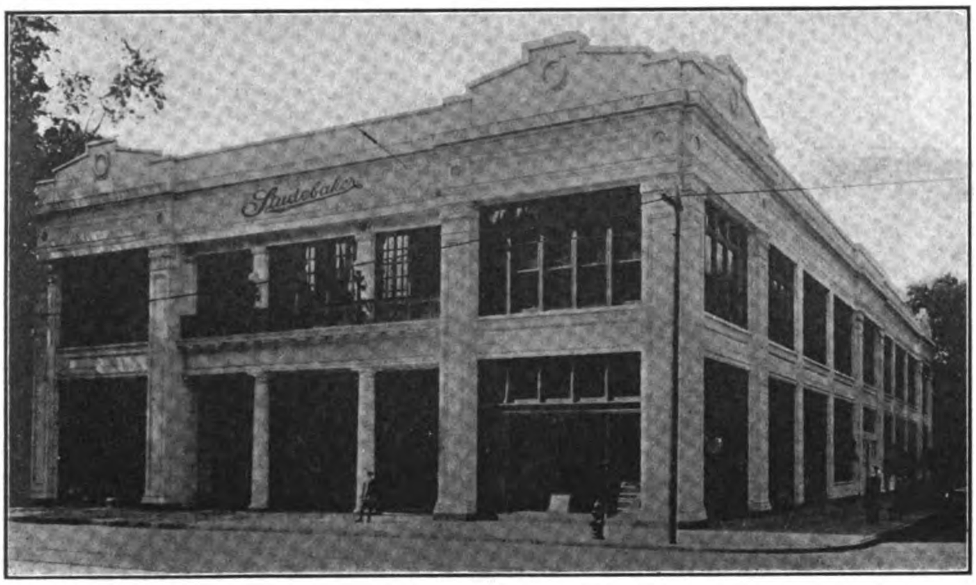
The Oakland Motor Car Company, Pontiac, Mich., has established a factory branch at 1905 Euclid avenue, Cleveland, O., of which Fred C. Wood is manager.

C. M. Dow has joined the sales force of the Tanner Motor Car Company, Brooklyn and Long Island distributor of the Flanders-Everitt line. Mr. Dow has had many years experience in the automobile field and goes to Brooklyn direct from the Everitt organization at Detroit.

The E. C. Andrews Company, Boston, has located in its new fireproof building at 67 Church street, near Park square and now has increased facilities and improved equipment for handling promptly all orders for automobile tops, slip linings, envelopes, storm fronts, etc.

The Willys-Overland Company, Toledo, O., maker of Overland cars, has leased for a long term the entire building at 915-921 Boylston street, Boston. Improvements will be made after which the building will be occupied. There is 6000 square feet of land, with a six-story fireproof structure, especially built for the automobile business and formerly occupied by the E. R. Thomas Motor Car Company's branch.

The Atlanta Tapto Top & Trimming Company, Atlanta, Ga., which was incorporated one year ago, expects to move into new and larger quarters in the near future. The new factory will be fully equipped and will carry an up-to-date line of automobile accessories. The officers are: President, J. Richardson; vice president, G. W. Anderson; secretary and treasurer, W. H. Spratlin.


Model Garage Erected by Studebaker Corporation, Detroit, Mich.

The Federal Rubber Manufacturing Company has secured quarters on North Broad street, Philadelphia, in which are located ideal sales and service rooms for the Federal line. Henry Benner is manager.

The Nordyke & Marmon Company, Indianapolis, Ind., maker of the Marmon automobiles, has established a factory branch at Kansas City, which is under the management of Fred D. Clinton.

S. H. Humphrey, for many years prominently identified with the automobile industry, has been appointed factory manager of the Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars. He will have charge of the 1913 output.

The Locomobile Company of America, Bridgeport, Conn., maker of Locomobile cars, has opened a factory branch at 3033 Locust street, St. Louis, Mo., with A. L. Ellwood, formerly of the Chicago branch, as manager.

The Moline Automobile Company, East Moline, Ill., maker of the Moline cars, has established a branch on East Washington street, Los Angeles, Cal., and the 1913 models are being shown. O. J. Root is manager of the wholesale department and George B. Vaston has control of the retail trade.

Walter C. Barnes, Springfield, Ill., is now publicity and advertising manager of the Moon Motor Car Company, St. Louis, Mo., maker of Moon cars. Mr. Barnes was formerly connected with the advertising departments of the Illinois State Journal, Springfield, Ill., the Idaho Statesman, Boise, Ida., and the Oregon Agriculturist of Portland, Ore. During the past year he was with the Lord & Thomas agency of Chicago.

The Ignition Starter Company, which manufactures the Disco starter and lighter, recently opened a direct factory branch and service station at 448-450 North Capital avenue, Indianapolis, Ind. H. L. Morgan is manager.

A. G. Bayerline has secured space in the plant of the King Motor Car Company, Detroit, where he is at work on a car which he intends to introduce in the near future. Mr. Bayerline was formerly general manager of the Warren Motor Car Company, Detroit, maker of Warren machines.

Clark A. Oostdyke, former director of purchases of the General Motors Company, has incorporated the Oostdyke Gear Shifting Company, Detroit, with $100,000 capital to manufacture a gear shifting device which does away with shifting levers on the car, the gears being operated by a keyboard on the steering wheel.

The American Locomotive Company, New York City and Providence, R. I., announces the following new agencies: Jefferson Garage Company, Syracuse, N. Y.; Pawlik & McGuidwin, Rochester, N. Y.; Merchants' Auto Service Company, Reading, Penn.; Downs Company, Minneapolis, Minn.; William Motor Car Company, Kansas City, Mo.; Villamil & Miller, Havana, Cuba; Thompson Auto Company, Detroit.

The American Auto Top & Slip Cover Company, Hartford, Conn., although established a comparatively short time, reports a rapidly increasing business and may have to expand in the near future.

The Lumen Bearing Company, Buffalo, N. Y., is preparing an addition to the already large plant of the company. When completed the concern will have one of the largest brass foundries in the country.

The Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, now maintains 60 branches throughout the United States, Canada and Mexico, each of which is in charge of an expert tire man as manager, who is assisted by a corps of workmen familiar with the Goodyear equipment. The object is to place at the disposal of motorists in the respective districts a service which shall be most complete in every way. An accompanying illustration presents the branch at 28 Custom House street, Providence, R. I., under the management of A. M. Bummister, and is typical of the various buildings devoted to the needs of the company in the smaller centres. Aside from the salesroom indicated, additional facilities are afforded in the rear for repair and replacement work, so that the branch becomes a service station in every sense of the word, as is true of all the other Goodyear branches.

Wallace G. Page, for many years connected with the Shawmut Tire Company as sales manager, has become associated with George S. Van Voorhis in the American Marine Equipment Company, Boston. The company has built up a large business selling automobile tires and supplies.

The Woods Motor Vehicle Company, Chicago, maker of the Woods electric, entered in the parade of old models under the direction of the Chicago Automobile Trade Association, the first electric built by the company. The car is 16 years old and is said to be the oldest electric pleasure vehicle in existence.

The Nyberg Automobile Works, Anderson, Ind., maker of Nyberg cars, has appointed the following agents: Harms and Cragun, Logansport, Ind.; Charles B. Hunter, Jr., Pittsburg, Kan.; D. E. Schwab, Sulphur Springs, Col.; Guild & Hackley, Medarysville, Ind.; A. D. Wright, Kansas City, Mo.

The McVey Manufacturing Company, Dayton, O., maker of the McVey automatic, portable vulcanizer, is making a novel offer to owners and dealers whereby it is possible to secure one of its vulcanizers free of charge.

The Studebaker Corporation, Detroit, maker of Studebaker cars, will soon open a model automobile garage, salesroom and repair shop as an object lesson to the army of dealers who annually visit the Detroit plants of the concern. The establishment, as shown in an accompanying illustration, will embody every advanced idea in arrangement, labor-saving devices and other details. A. K. McLuney is manager of the garage, which will be headquarters for the recently organized Detroit branch of the corporation.

The Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, recently gave to the Oakland dealers of the country a dinner at the Pontchartrain hotel, Detroit, known as "The car with a conscience" dinner and a large number of dealers and employees of the concern attended. Previous to the banquet an inspection of the plant was made, the accompanying photograph showing the dealers at the factory. A feature of the dinner was the menu card, in the form of an Oakland radiator. Among those present were: J. W. Martin, Minneapolis; H. L. Hornberger, San Francisco; B. G. Campbell, San Antonio, Tex.; H. L. Leech, Philadelphia; L. F. Smith, Atlanta, Ga.; M. D. Stone, Nashville, Tenn.; J. G. Kreig, Oskaloosa, Ia.; C. L. Barnes, Birmingham, Ala.; H. G. Sperring, St. Louis, Mo.; W. H. Head, Omaha, Neb.; W. J. Sutliffe, Waterloo, Ia.; T. N. Shambaugh, Kansas City, Mo.; Theodore Brinkman, Kansas City, Mo.; R. R. Hall, New York City; C. Briggs, East Orange, N. J.; V. N. Weidman, Jersey City, N. J.; J. T. Fremont, Paterson, N. J.; R. J. Handerson, Toronto, Can.; G. O. Wildhack, Indianapolis, Ind.; C. W. Tremain, Fort Dodge, Ia.; H. C. Turner, New York City; Dean Schooler, Des Moines, Ia.; S. L. Stone, Buffalo, N. Y.; L. W. Smith, New Haven, Conn.; C. E. Hoffman, Buffalo, N. Y.; Frank O'Dell, Pittsburg, Pen.; W. L. Cameron, Dallas, Tex.; Will Tracy, Detroit; J. F. Montgomery, Detroit; F. C. Wood, Cleveland, O.; R. A. Wadsworth, Chicago; J. F. Walsh, Boston; W. C. Gray, Buffalo, N. Y.; Frederic Eaton, Pittsburg; R. A. Creek, Milwaukee, Wis.; H. I. Bunting, Cedar Rapids, Ia.; Frank Remsen, Atlanta, Ga.: President Thomas Neal, General Motors Company; G. E. Daniels, J. B. Eccleston, F. H. Berger, E. H. Tinsman, J. H. Newmark, T. W. Wilson, L. P. Stone, H. H. Thatcher, H. A. Bauer, J. S. Hull, T. D. Culberhouse, A. N. Greene, H. R. Voit, N. E. Wahlberg, F. O. Ronk, K. B. Alexander.

The Pennsylvania Rubber Company, Jeannette, Penn., manufacturer of the well known vacuum cup automobile tires, has opened a direct factory branch at 149 Berkeley street, Boston, at which place the company will carry a complete line of its tires and products. G. W. Lawrie is in charge.

The Oklahoma Motor Truck Company, Tulsa, Okla., manufacturer of commercial motor trucks, has started a new factory on Boulder street. P. E. Haworth is president of the firm.

The Federal Motor Truck Company, Detroit, maker of Federal trucks, has appointed new agents as follows: Federal Truck Company, St. Louis, Mo.; L. S. Mitchell Auto Company, Chattanooga, Tenn.; Wesley Hill Garage, Phoenix, Ariz.; Vancouver Isle Motor Company, Victoria, Vancouver Isle, B. C.

Norman Chilsen, Merrill, Wis., is causing to be erected near his garage a three-story building of solid brick construction, in which he will conduct his automobile business.

The K-R-I-T Motor Car Company, Detroit, maker of K-R-I-T cars, has recently closed a contract for 1913 with the Northwestern Automobile Company, Minneapolis, Minn., to handle its line in the northwestern territory. The sales concern is well known to the trade, not only in the Northwest, but throughout the country where it has been identified with the distributing end of the industry since its inception. The accompanying illustration of the showroom shows the modern quarters it possesses for handling its large and growing business.

GARAGE & DEALER

J. L. Tippins has opened a tire repair shop on Broughton street, Savannah, Ga.

The Lemaster Garage, Ottawa, Kan., has been sold to William D. Sprague by Glen J. Lemaster, the former owner.

John H. Gerhardt, Laurel, Kan., has purchased for $30,000, the Frizzel garage, formerly conducted by E. E. Frizzel.

Federal Auto Accessories Company, Columbus, O., is the name of a new concern which has started business in that city.

Ira N. Thompson, Columbus, O., has opened a new garage on North Fifth street, with a capacity for storing 36 machines.

W. C. Stopher has opened a garage on North Market street, Wichita, Kan., and will handle the Regal and Abbott-Detroit lines.

The Rude Auto Company, Perry, Ia., is planning enlargements to its establishment and will conduct a garage and repair shop.

The Boone Auto Company, Boone, Ia., is to erect a modern, one-story garage to cost $15,000, plans having recently been perfected.

Fred Redetzke has taken possession of the garage and automobile repair business formerly conducted by E. H. Mann at Hebron, N. D.

The R-L Company, Boston, New England distributor of Garford cars, made by the Garford Company, Elyria, O., recently opened new salesrooms and a service plant on Boylston street. L. T. Rainier is president of the new company.

F. W. Anderson has purchased the Henry garage at Coon Rapids, Ia., and will conduct a first class repair shop in connection with it.

The Warren Automobile Company, St. Louis, Mo., is temporarily located at 4376 Olive street pending the completion of its building on Locust street.

Edward Bean has opened a new garage and repair shop on Columbus avenue, New Haven, Conn. He will also use the rooms for storage purposes.

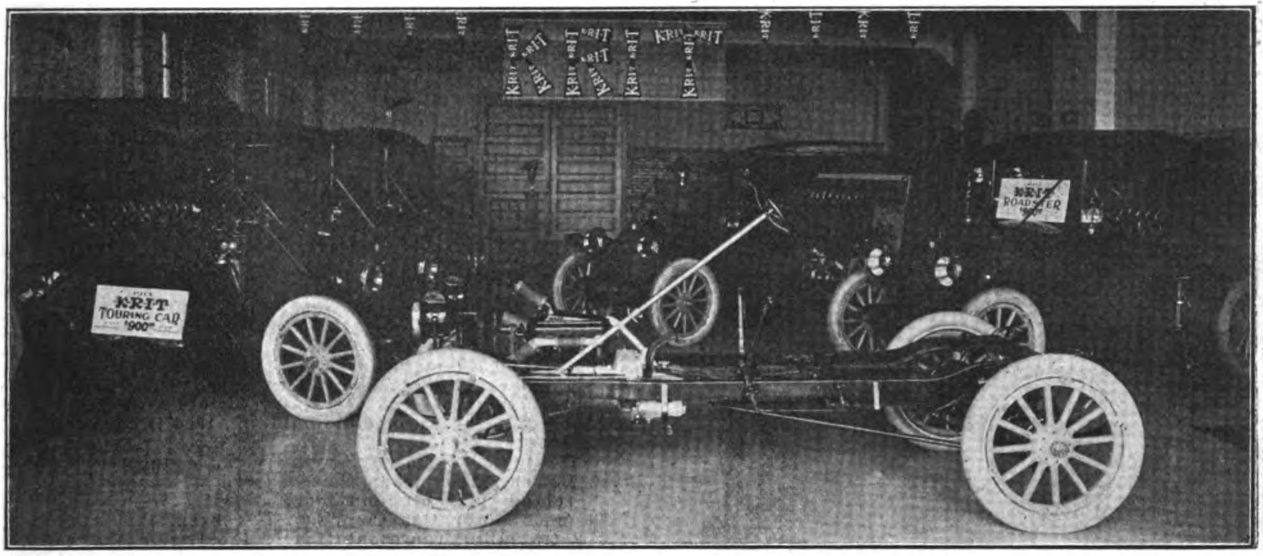
The Park Garage at South Pasadena, Cal., has undergone a change of management and incorporation papers have been taken out by the new partners.

The West Shore Garage Company, New York City, has leased the building at 406-408 West 45th street, of the Duross Company and the Cross & Brown Company.

Ralph Smalley has purchased an interest in the Eagle Grove Auto Company, Eagle Grove, Ia. He will handle the Overland car, made by the Willys-Overland Company, Toledo, O., besides doing a general auto repairing business in connection with the garage.

The Matthews Auto Company has moved into new quarters on South 20th street, Birmingham, Ala. The firm is composed of S. H. Matthews and Dr. J. E. Frazier, who handle the Inter-State, Firestone-Columbus and K-R-I-T.

The South End Garage, New Bedford, Mass., has just been completed for Manuel G. Souza. It is the first big public garage to locate in that section of the city and is equipped with every facility for the convenience of the car owner. Mr. Souza will make a specialty of supplies and repair work.



Salesrooms of the Northwestern Automobile Company, Minneapolis, Minn., Distributor for the K-R-I-T Line.

W. D. Nellis, Watertown, N. Y., is to erect a garage on Jackman street to be two stories in height. The building will be ready for occupancy in the near future.

The Oldsmobile Company of Missouri, of which Gratiot Cabanne is president, has leased for 10 years a new building of two stories and basement on Locust street, St. Louis, Mo.

A. L. Crowthers & Son, Coshocton, O., has opened a garage and salesroom and in addition to carrying the Studebaker and Flanders lines, will include several other makes of cars.

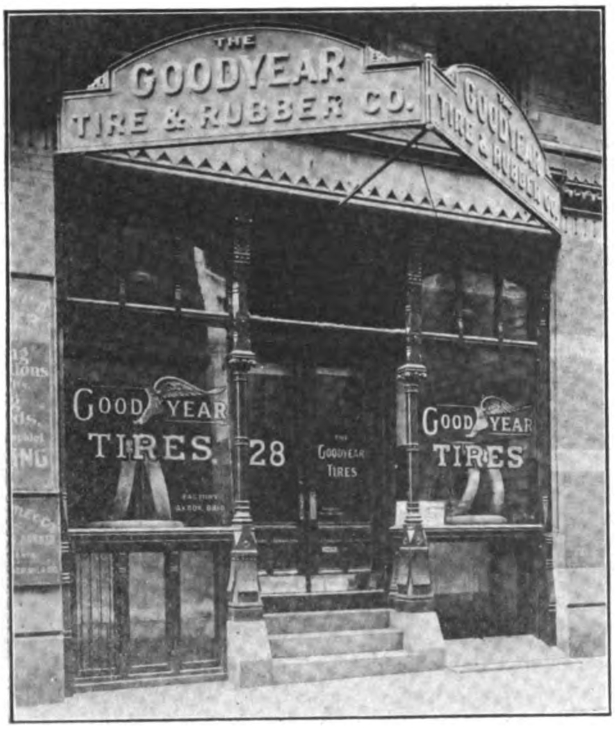
The City Hall Garage is a new establishment for the convenience of the automobile public at Saginaw, Mich. It is on South Washington street and is owned by Albert Marienthal and A. Smallwood.

The Motor Car Service Station, having outgrown its old quarters at 1935 Euclid avenue, has been located at 4824 Payne avenue, Cleveland, O., by the proprietors, H. Houserman and P. G. Forbush.

Steele & Metcalf, Howarden, Ia., implement and automobile dealer, has purchased the business of Charles W. Keniston, who was in the same line. The new firm will continue the business on a larger scale.

Edward Grover and Edward Scheuer, Two Rivers, Wis., have leased a building in which they will conduct a machine and automobile repair business. They will furnish automobile parts and accessories.

The Heimsch Automobile Company, St. Louis, Mo., has purchased a plot of land on Grand avenue upon which John N. Bleeck, president of the company, and his associates plan to erect a garage and repair shop to cost $30,000.



Goodyear Tire & Rubber Company's Branch at Providence, R. I.

Dr. D. F. Howard, president, and R. S. Brownlee, secretary and treasurer, have formed a stock company at Brookfield, Mo., with a capital stock of $10,000 for the purpose of building a modern garage at West Boston and Livingston streets.

John Sheridan and Albert Dennis, expert automobile men of Holyoke, Mass., have opened a garage on Main street, that city, which they later intend to remodel and extend. The plant is equipped with every modern convenience for the garage business.

The Finch-Freeman Auto Company, Indianapolis, Ind., has established a service station for the accommodation of the owners of Regal and Nyberg cars. The second floor of the building on North Capitol avenue has been given over to this department, which is one of the most complete of its kind.

The Cadillac Sales Company, Pittsfield, Mass., has just been organized and quarters have been taken on South street in a garage recently completed. The company is managed by Roy S. Bridge and Edward A. R. Brown, who have contracted for 23 of the 1913 model of Cadillac cars, made by the Cadillac Motor Car Company, Detroit.

Frank N. Phelps, Boston representative of the Baker Electric Vehicle Company, Cleveland, O., maker of Baker electric commercial cars, has recently moved into new quarters at Boylston and Fairfield streets. In connection with this sales department a service station for New England will be conducted at 90 Chestnut street, Boston.

Island City Garage, Galveston, Tex., has been purchased by Frank Freund, George Frank and Edwin Frank, the former owner, Joseph Bader, retiring from the automobile business. The establishment will be known as the New Island City Garage and special attention will be given to the repair of automobiles and their storage.

The Davenport Auto Company, Davenport, Ia., has been purchased of Steinhauer & Frey by A. Leberman and G. V. Davis. In addition to handling the K-R-I-T, made by the K-R-I-T Motor Car Company, Detroit, the Apperson, made by Apperson Bros.' Automobile Company, Kokomo, Ind., and doing general repair work, the firm will operate a line of taxicabs.

The Atlanta Automobile Sales Company, Atlanta, Ga., composed of some of the best known and successful automobile men of that city, is a new company recently organized to handle for that territory the National, Henderson and Flanders lines. The concern is located on Peachtree street in quarters formerly occupied by the Fulton Auto & Supply Company.

The Pierson Harris Company, Inc., Atlantic City, N. J., now occupies a three-story fireproof building recently purchased at Arkansas and Arctic avenues. The firm will retain its old location at 2013 Arctic avenue for carriage and wagon work. New capital has been added and the company proposes to do only the highest class of work in automobile painting and lettering, and manufacturing tops and trimmings.

Hawley, King & Co., Los Angeles, Cal., southern California and Arizona distributors of the Oakland car, made by the Oakland Motor Car Company, Pontiac, Mich., has moved its branch store into new quarters at 1027-1033 South Olive street. Hawley, King & Co., has dealt in vehicles since 1882 and one of the chief aims of the concern is service, which will be given special attention in the new quarters.

H. W. Pierce, automobile dealer at Butte, Mont., will engage in the automobile business at Spokane, Wash., operating as the Washington Motor Car Company, jointly with his Butte place, known as the Silver Bow Automobile Company. He has the agency for the Stevens-Duryea car, made by the Stevens-Duryea Company, Chicopee Falls, Mass., and is temporarily located in the garage formerly occupied by the Pacific Motor Car Company.

W. H. Fuller, who has a showroom at Washington and Snow streets, Providence, R. I., in the centre of the automobile trade, and a service station on East avenue, Pawtucket, R. I., has taken the agency for Cole cars, made by the Cole Motor Car Company, Indianapolis, Ind., for Rhode Island, the Attleboros and Taunton, Mass. For the past four years Mr. Fuller has handled the Garford, E-M-F and Flanders lines.

Manager C. S. Henshaw, formerly of the Thomas Motor Company of New York, has established temporary quarters in the Automobile building, 1926 Broadway, New York City.

Fred W. Thomas, for many years connected with H. A. Lozier & Co., when that concern was manufacturing Cleveland bicycles and more recently with the E. R. Thomas Motor Car Company, has been appointed special travelling representative of the Lozier Motor Company, Detroit, maker of Lozier cars, in New York and Pennsylvania. Mr. Thomas succeeds W. L. Davis, formerly travelling in the eastern territory for the Lozier company.

J. W. Bowman, Boston distributor of the Stevens-Duryea machines and Waverley electric vehicles, has returned from England on the Franconia after an interesting tour abroad.

The W. E. Allen Company, Milwaukee, Wis., is planning the erection of new salesrooms on Grand avenue, between 27th and 28th streets.

J. P. Winterson, formerly connected with the eastern sales department of the Lozier Motor Company at New York City, has been appointed special travelling representative for that company in the Southwest, having in his territory, Colorado, Kansas, Missouri, Arkansas, Texas, Oklahoma, New Mexico and Louisiana.

J. S. Standlee, Ventura, Cal., formerly head mechanic of the Mission garage, has purchased the plant of the former owner, Bursen & Fowler.

The Tyler Bros. Corporation, a new Boston concern, has opened quarters in Motor Mart, Park Square, in that city and will handle several makes of cars exclusively in New England. Frank J. Tyler is president of the company and L. S. Tyler, who has long been identified with his brother, first with the Maxwell-Briscoe Boston Company and later with the United States Motor Company, is treasurer.

The Martin Sales Company, organized as distributor of Martin shock absorbers, has established agencies at San Diego and San Francisco, Cal., with the home office located at Los Angeles, Cal. A service station and salesrooms have been secured on West Pico street, the latter city, in which are ample facilities to equip automobiles with Martin shock absorbers. The members of the concern are: P. D. Mason, Allan T. Archer, W. L. Graves, Jr., and W. S. Ingram.

The Landman-Griffith Motor Company has been formed at Toledo, O., with a capital of $10,000 and a sales and service building will be erected at 14th street and Madison avenue to cost $25,000. The entire front of the building will be of glass. Charles P. Landman is president and W. E. Griffith is secretary and treasurer.

The Blackford Auto Inn., Hartford City, Ind., has been purchased by John Confer, who has taken possession.

Buchanan Auto Company, St. Joseph, Mo., has begun work enlarging and improving its garage on Frederick avenue and alterations will be completed soon.

Charles D. Brown has sold his interests in his stable and garage at Rochester, Minn., to Anton Hasley, who plans extensive improvements.

J. J. Strack, Blue Earth, Minn., has taken charge of the garage formerly owned and conducted by Hugh Lucas.

Paul Luge and Joseph Poiser, McKeesport, Penn., have opened an up-to-date machine shop on White street and are making a specialty of automobile work.

The Schornstein Automobile Company, St. Paul, Minn., has recently moved into its new quarters on Layton's Bluff. The concern represents the Lambert trucks and cars, made by the Buckeye Manufacturing Company, Anderson, Ind., and carries a complete line of accessories and supplies, in addition to doing expert repair work.

The Chessman Automobile Company, Salt Lake City, Utah, is building a new and modern garage to cost $10,000.

Charles Moeller & Son has occupied its new garage and wagon shop at Elizabeth, N. J., to be known as the New Point garage, which was recently completed. The firm will do repairing, painting and storing and will also carry a full line of automobile accessories. Moeller & Son will continue the building of wagon and automobile bodies in its new building, which is one story high and of concrete block construction.

The Savannah Auto Repair Company, Savannah, Ga., which started in business on a small scale a few years ago, has increased its equipment from time to time until today it has one of the finest and largest exclusive automobile repairing and rebuilding plants in the South. The company has a fully equipped woodworking plant, for building truck and pleasure car bodies and a few weeks ago a complete top department, equipped for making all kinds of tops, curtains and aprons, was added.

G. L. Hudkins of the Hudkins Motor Car Company, Salina, Kan., is to erect a garage and Ford hospital on 7th street, that city, in which modern and commodious quarters will be located. The second story will be used for Ford automobile supplies and the firm will engage in jobbing in connection with its other business.

The South Brooklyn Auto Livery and Sales Company, Brooklyn, N. Y., recently incorporated by C. H. Hohorst, J. B. Haff and C. Hohorst, has just opened its large garage, which has 25,000 feet of floor space. The establishment is not only for storage purposes for commercial and pleasure cars, but for repairs, painting, upholstering and supplies, with a rental department of taxicabs, touring cars and limousines. The company is agent for the R-C-H cars, made by the R-C-H Corporation, Detroit.

The Overland Motor Car Company, Hutchinson, Kan., has sold its garage, repair shop and accessories store to W. Hazlett, who will conduct these features of the business. The Overland company will devote its energies to the distribution of Overland cars and Goodyear tires.

O. C. Brown, Anderson, Ind., who has had extensive experience in the automobile business, has purchased the Central garage of Wagner Stitaman, who formerly conducted it.

William H. Bartleman is general manager and Richard F. Reed is sales manager of a new company formed at 620 North Broad street, Philadelphia, to handle the Regal cars, made by the Regal Motor Car Company, Detroit.

The Brown-Rawson Garage Company, Gardner, Mass., has been formed and a new garage and repair shop has been opened on North Main street.

C. W. Gray, proprietor of the State street garage, Watertown, N. Y., is building a second story to the present building, the lower floor to be occupied by the Watertown Auto & Supply Company.

Behrens & Bushnell, Centerbrook, Conn., has made plans to build a large garage addition to its present automobile works.

The Hibbing Automobile Company, Hibbing, Minn., a copartnership between J. R. Pomeroy and M. J. McGovern, was recently dissolved and the business was sold to O. W. Oldham, who is conducting it under the old firm name.

C. M. Barnes & Son is now the owner of the Garner Auto Company garage, Garner, Ia., which was recently purchased of H. F. Kellogg.

The Sidney B. Bowman Automobile Company, New York, has permanently located its salesrooms with its service department, 225-231 West 49th street. Extensive alterations have been made to the building and Theodore E. Schulz has charge of the sales department.

The J. D. Perry Lewis Automobile Company, St. Louis, Mo., has leased the store building at 4108 Olive street and extensive alterations have been made to accommodate the company, which will use the new quarters as the central salesroom for Moon cars, made by the Moon Motor Car Company, St. Louis. The new lease is for a term of years.

The Pioneer Automobile Company, Los Angeles, Cal., has opened headquarters for the Flanders electrics exclusively. The new concern will be housed on South Olive street and the Lord Motor Car Company, which formerly handled the Flanders line, will now concentrate its efforts in distributing the Reo and Garford products.

The Standard Auto Garage, of which Charles Johnson is owner, will erect a modern garage at Uniontown, Penn. It will be three stories high, fireproof construction and will cost $50,000.

The Woodbury Garage, Woodbury, Conn., formerly owned by Paul Bronson, has been purchased by Fred St. Pierre, who has taken possession.

Arthur McNall has moved into his new garage at Rochester, N. Y. The building is three stories high and Mr. McNall has the agencies for the Peerless pleasure and commercial lines and Rauch & Lang electrics.

The Rozell Harris Company, Hackensack, N. J., has established a new garage on Mercer street, in which a general repair business will be conducted.

The Overland Sales Company, Cleveland, O., has purchased property on East 22d street and will erect a new three-story building for automobile purposes. The new structure is to be of brick, fireproof construction. The present building of the concern will be enlarged.

L. F. Case, former partner of J. S. Landon in the operation of the Landon garage at Elkhart, Ind., has acquired full possession of the establishment.

J. Caesar, St. Louis, has purchased a half interest in the Palace garage, Webb City, Mo., owned by William Miller, Charles Marquis and Clarence Glazier. Mr. Caesar intends to add a large amount of supplies and equipment to the plant.

The Colonial Automobile Company, St. Louis, Mo., of which Louis Goodhart is vice president and sales manager, and Henry Deabold is president, has become the factory branch distributor in western Illinois and half of Missouri for the Flanders electrics. The company's location is at 3948-3950 Olive street.

The Congressional Garage, Washington, D. C., has been granted permission to erect an addition to the plant on Pennsylvania avenue at a cost of $7000.

B. Platt & Son, Hamilton, Ont., which has just completed the erection of a handsome garage at 752 King street, east, has been appointed representative of the Studebaker Corporation of Canada, maker of Studebaker cars, the American factories of which are at Detroit.

The Whittier Garage Company is now installed in its new home at Philadelphia street and Newlin avenue, Whittier, Cal.

George L. Gasler has purchased property at Niagara Falls, N. Y., for $15,000. It is centrally located and Mr. Gasler proposes to erect a large garage to be fitted with the latest facilities for conducting the automobile business. The firm which Mr. Gasler heads has been incorporated as the Niagara Falls Automobile Transit Company, the other incorporators being M. M. Gasler and E. U. Gasler. In addition to handling the Peerless cars, made by the Peerless Motor Car Company, Cleveland, O., and the R-C-H machines, made by the R-C-H Corporation, Detroit, the firm will conduct an auto livery business. The new garage will cost $50,000.

The Howard Automobile Company, 523-525 Golden Gate avenue, San Francisco, Cal., of which C. S. Howard is president, has taken the three floors and basement of a warehouse on Sutter street for a repair shop. The firm is wholesale distributor of Buick cars, made by the Buick Motor Company, Flint, Mich., and the National machines, made by the National Motor Vehicle Company, Indianapolis. Branches are maintained at Los Angeles and Oakland, Cal., and Portland, Ore.

The Main Street Garage Company, Pullman, Wash., has opened a general automobile supply and garage business under the management of A. L. Reid.

The F. S. Slansky Electric Company, Cleveland, O., has plans for the establishment of a modern garage and automobile shop to be erected in the near future.

The J. A. Wigmore Company, Cleveland, O., will erect a new garage in that city at a cost of $30,000.

The Charles Schrear Motor Car Company, Cincinnati, O., will make additions to its garage which will cost $5000.

George Wood, for a number of years connected with the Pittsfield Spark Coil Company's plant, Dalton, Mass., has removed to Hoosick Falls, N. Y., where he will open a garage.

The Perry Motor Supply Company, Hartford, Conn., has occupied new and commodious quarters at 100 Allyn street, that city, which will be conducted in connection with the company's store at 102 Allyn street. The improvements complete one of the finest stores in New England. The service department is equipped with a full line of supplies for motorists, both wholesale and retail. In conjunction with its automobile supply business the company has installed a repair station for the Stewart speedometers and will make repairs to lamps, radiators, fenders, etc., for which drills and other necessary machinery have been purchased.

James E. Morse, Watertown, Mass., has begun the erection of a garage on Prentiss street, having accommodations for 50 cars.

The Rockrimmon Garage, Portsmouth, N. H., formerly owned by J. H. Hyslop, has been purchased by J. W. Edwards and Ralph C. Dicket of Burlington, Vt.

The Indianapolis Automobile Clearing House, Indianapolis, Ind., recently incorporated for the purpose of dealing in automobiles, has the following officers: President, E. J. Kane; vice president, T. E. Byrne; secretary and treasurer, John L. Duvall, all of whom will act as directors of the company. The concern will specialize and act as a clearing house for second hand cars.

The Georgian Terrace hotel garage, recently completed at Atlanta, Ga., is said to be the largest building used exclusively as an automobile garage is the South. The establishment is conducted in connection with the Georgian Terrace hotel, which entertains many tourists throughout the year. In addition to having every equipment needed for the repair and upkeep of automobiles, the building is sufficiently large to have offices, sleeping rooms, a hospital, reading rooms, barber shop, tailor shop, club and billiard rooms, besides other modern conveniences for the benefit of employees and chauffeurs travelling with touring parties.

Brown & Fairbanks, proprietor of the Main street garage, Rochester, Minn., has opened its place of business to the public.

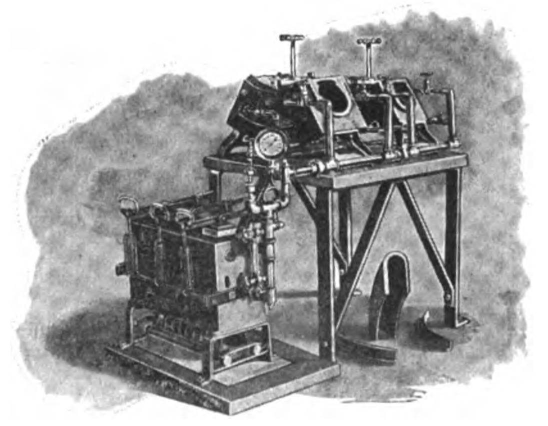
R. M. Owen & Co., New York City, has moved its executive offices and the New York Reo branch to new and more commodious quarters at 19-21 West 62d street. R. E. Ingersoll, manager of the branch, said that the high rent and limited space made the move imperative.

Electric Star Auto Headlights and Tail Lamps

The lamp that has no rivets nor solder, and only one screw used in its construction. It is made of cast silvered aluminum, and the interior is highly polished, which does not tarnish. The convex lenses are laid in rubber, which makes them water and dust proof, and same is the strongest lamp made. Write for cataogue. Mfd. by

Milwaukee Bronze Casting Co., 119 Clinton St., Milwaukee.

Are You Getting Your Share of The Dollars?



TIRE REPAIR MEN ARE MAKING MONEY. Right now and for the next two months this business will be at its best. Tires that were new in the spring need repairs. Auto owners are repairing tires to make them last out the season. An increasing number of cars will be run all winter.

YOU OUGHT TO SHARE IN THE PROFITS. Install an **AKRON-WILLIAMS** outfit, the kind used and recommended by twenty-seven out of thirty tire makers and by successful repair men everywhere. Ask your tire maker about us.

IT DOESN'T TAKE MUCH MONEY to buy the best plant and you can make more with it than with an investment four times as large in any other line. We have outfits from $40.00 to $1000.00, depending upon how much and what range of work is to be handled. Every outfit is standard.

Get Into This Profitable Business Now

Write Today for Catalog 12

The Williams Foundry & Machine Company

Ash Street, Akron, Ohio.

The Weinstock-Nichols Company, San Francisco, dealer in automobile accessories, has issued a folder to its sales force giving information and advice upon the methods of conducting business. The folder is intended as an incentive to awaken enthusiasm in the trade and make for better service.

The Maynard Rubber Corporation, Springfield, Mass., has sold its retail store to John F. Ayres, who has taken possession and is continuing the business under the name of Ayres' rubber store. The Maynard Rubber Corporation will retain its retail and wholesale store at 520-524 Worthington street, selling automobile trucks and rubber tires of all kinds, together with the vulcanizing and mechanical departments, giving its entire attention to these lines.

H. L. Garton, Centerville, Ia., has opened a new garage at 310 West Van Buren street. He will do all kinds of repair work besides storing automobiles.

Edward A. Ross, Auburn, N. Y., has opened a thoroughly equipped garage on Water street. Mr. Ross is well known in New York State as one of the best salesmen of Overland cars, made by the Willys-Overland Company, Toledo, O.

The Mutual Motor Car Company, Buffalo, N. Y., agent for the Marathon cars in New York State, and for the Warren machines in western New York and northern Pennsylvania, has opened new salesrooms on Main street.

Isaac C. Kirkham, Brooklyn, N. Y., has purchased a three-story building at 33 Grant avenue and will remodel it into a garage and salesroom.

The Congress Garage Company, Cohoes, N. Y., has opened its new establishment on Lancaster street. William D. Bowdy is manager.

The Splitdorf Electrical Company, Newark, N. J., has opened a service department at Broadway and 62d street, New York City.

Hester Bros., Hudson, N. Y., has purchased the Malley garage and will conduct it under the name of the Warren street garage.

The Pulaski Auto Supply & Garage Company, Pulaski, N. Y., has been formed by G. C. Edick, Anselm W. Brown and George H. White, who have leased the Selkirk Creamery Company building. The firm will conduct a general automobile business.

The Hicks Auto Supply Company, Nashville, Tenn., is a new automobile accessory firm which has opened quarters on Broadway. The concern will do a wholesale business and will carry a full line of accessories and supplies.

The Olds Motor Works, Lansing, Mich., maker of the Oldsmobile, has sold its garage and agency in that city to T. W. Creeve, who will continue the business.

Robert Herrick and John McDonald have taken possession of the Hughes garage, Marshfield, Wis., having purchased it of the former proprietor, Orrin R. Hughes. The firm will be known as the Hub City Auto Company.

A. J. Cleveland and H. A. Brownlee, Salina, Kan., have consummated a deal whereby they assume the management of the Clark automobile garage on North Sante Fe avenue, Roy Clark, the former proprietor, having retired.

The Fort Madison Auto Supply & Engine Company, Fort Madison, Ia., is to construct a two-story, brick garage at Second and Cedar streets. It will have modern fittings and a commodious display room.

The Grand Boulevard Garage, Glendale, Cal., has been sold to Edward Dale and F. M. Buffehr, formerly of Tonopah.

Dickey & Edwards, new owners of the Rockingham garage, Rockingham, N. H., are making many alterations and intend to have one of the most up-to-date establishments in New Hampshire. A machine shop, equipped with all the latest high speed tools has been installed and the garage will now house about 75 machines.

The Auto Shop, Plainfield, N. J., has been opened by John Cline and Dennis Beglin, who will do all kinds of automobile repairing.

The Union Motor Car Company, Washington, Penn., has been organized and will occupy quarters at 442 West Chestnut street. The concern will conduct a general garage and will carry a full line of accessories and supplies pertaining to the automobile business. M. C. Burchfield is president and B. R. Cutler is sales manager of the new concern.

John Stone, formerly of the Independent Auto Repair Company, Lincoln, Neb., has established the Stone auto repair shop at 812 Walnut street, Des Moines, Ia. Mr. Stone is now constructing a car which he claims will have the largest wheelbase of any private machine in the country.

The Mercury Motor Truck Company, Chicago, has opened a new salesroom at 2009 Michigan avenue and will carry a full line of Mercury trucks.

Glenn Brubaker, Litchfield, Ill., has purchased the Waggoner garage on North State street of Stanley Waggoner, the founder of the plant.

The Rayfield Motor Car Company, St. Louis, has disposed of its entire output to the Brown Auto Company, St. Louis, the Brown company taking over the agency for the entire United States.

A little goes a long way and every drop counts

HARRIS

TRADE MARK REG. U.S. PAT. OFF.

OILS

HARRIS
LIGHT

Will make your engine work smoother, give increased power, no trouble and real efficiency. Ask your dealer for HARRIS OILS.

Send for testimonial letters.

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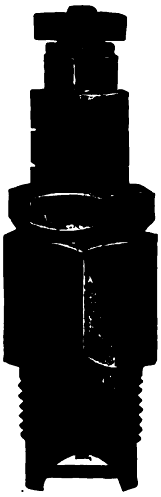
326 S. Water St., Providence, R. I. 143 No. Wabash Ave., Chicago, Ill.



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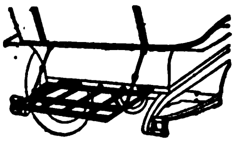
Spark Plugs

Do not foul, soot or short circuit.
A high grade plug at a low list price.
Scientifically constructed. Our discount to jobbers and dealers makes the cost of these plugs very low.
Write for catalogue.

SALES OFFICE **DETROIT, MICH.**

HEINZE ELECTRIC COMPANY

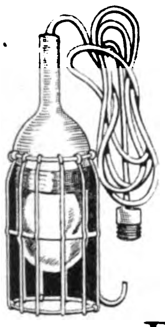
Station E **LOWELL, MASS.**



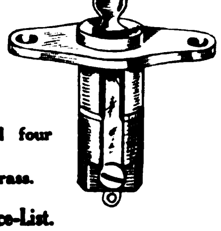
"STANDARD" TRUNK RACKS

Connecticut Steel and Wire Co., Hartford, Conn.

PORTABLE HAND LAMPS



only absolutely safe lamp for use where gasolene is used. Vapor and waterproof.



PULLRITE SWITCHES

In one, two, three and four button.

Nickel, polished or old brass.

DEALERS: WRITE for Price-List.

Frank W. Morse Co.

516 ATLANTIC AVE. BOSTON, MASS.

USE NO ACIDS

"Simplex" Aluminum Solder

WILL DO ALL THIS FOR YOU:

It has the holding grip on all soft metals; is non-corrosive and is a good conductor of electricity. Will solder everything---aluminum to brass, copper, etc. We will give $100 for any aluminum casting brought to us we cannot solder. We solder with an ordinary iron, and what we do solder, "STICKS" because it is in OUR SOLDER.

30 Cents

will bring you a sample to prove it to you.

Special Inducements to the Trade.

Simplex Aluminum Solder Co., Inc.

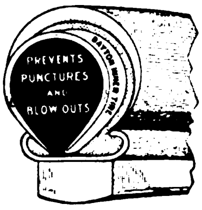
108 Broadway, Long Island City, N. Y.

Tel. 988 Astoria.

Try the New Aluminum Solder. Ask for "Simplex."

"SIMPLEX" Solder has the stick.

TIRE TROUBLE STOPPED



Wear the tread completely off your tires by using the

Dayton Inner Tires

ABSOLUTELY prevents BLOW-OUTS, and 90% of PUNCTURES.
Prevents tube pinches from fabric breaks.
Easily inserted and can be changed from OLD to NEW casings.

Write (Right Now) for Descriptive Catalog.

AGENTS WANTED.

DAYTON INNER TIRE AND MFG. CO.,

DAYTON, OHIO, - - 17 Madison Street.

Garageman! Repairmen!

Economize Space and Save Labor with the

UNIVERSAL

Combination Auto Jack and Emergency Truck

Useful with Every Repair Job. Safer Than Jacks and Blocking. With It One Man Can Handle Any Car. Will Endure a Lifetime. Get Booklet 4-C.

Canton Foundry & Machine Co., Canton, O., U.S.A.

ABSOLUTE TIRE PROTECTION

GIVEN ONLY BY THE

Hopewell Tire Case

It prevents any water entering the spare tire (either from rain or hose used in washing). Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

Hopewell Brothers **Newton, Mass.**

THE "ALL-IN-ONE" SPARK PLUG

All That the Name Implies

Prime your engine and clean your plugs at the same time.

Price $1.50 Each

Powerful Sootless Durable

Designed and constructed for use with high or low tension magneto and battery ignition systems.

Made to fit any engine

We shall prosecute vigorously all infringements now on the market or any which may spring up in the future

FRONTIER SPECIALTY CO.

732 Main Street

BUFFALO - - - - - NEW YORK

This is it

The Oil Most talked about today.

The Oil with the 20,000 mile record.

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NO-KARBON (REGISTERED) EAGLEINE AUTO CYLINDER OIL

It suits and does not soot. In 4 and 6 cylinder water cooled cars.

Ask about it.

AGENTS Proposition For Live Dealers

EAGLE OIL & SUPPLY CO.

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—DEALERS—

The J. & B. Master Vibrator

Perfects Any Spark Coil Ignition System.

Absolutely Synchronizes a Motor of Two or More Cylinders, Firing Each Cylinder When the Piston is in a Precise Position.

Suited for All Systems Having Two or More Coils. Gives Up to 25 Per Cent. More Power and Slower Speed on Direct Drive.

But One Adjustment of Contacts, Made of an Alloy of Platinum and 25 Per Cent. Iridium.

A Splendid Specialty For a Live Wire in the Trade.

PRICE COMPLETE, $12.

Agents and Dealers: Write for Proposition.

J. & B. MFG. CO., - - Pittsfield, Mass.

"PASS THEM ALL"

Knox

BEST BY TEST

MOTOR CARS

Send for Pleasure or Commercial Catalogue.

KNOX AUTO CO., Springfield, Mass.

New Departure "TWO-IN-ONE" Ball Bearings

The only ball bearing that takes load from any direction with equal efficiency.

Catalog for the asking

THE NEW DEPARTURE MFG. CO.

Bristol, Connecticut

STOLEN AUTOS

Can be prevented with our

AUTOLOCK SWITCH

Put on Coil or Dash in ten minutes. Yale key for plug. One operation. Write for descriptive folder and price.

BLACKBURN SPECIALTY CO., 1132 Prospect Ave., Cleveland, O.

FOR SALE—Attention of Truck Makers—We have on hand about 500 jack shafts for a 1000 to 1200-pound truck. These we will not be able to use owing to a change in design and to an interested party that can use these parts we will make a sacrifice price. Box 50, Accessory & Garage Journal.

CHAUFFEUR'S COMPLETE OUTFIT SACRIFICED—Consisting of elegant mink fur lined coat, Persian lamb collar $35, pair of elegant bear robes $15 each, Racoon Cap $5, pair of fur gloves $4, pair of goggles 50c, one pair leather leggins $3.50. Will sell separately or the lot, all new, never worn; original price $225. G. Chase, 118 East 28th St., New York.

BUSINESS CHANCES—New proposition; $10 to $15 daily; made easy; men, women, everybody buying; capital, experience unnecessary. Selling plan, particulars free. J. C. Jackson, 4759 Evanston Ave., Chicago.

FOR SALE—A new fire-proof, three-story Garage and business in one of the best locations in New Jersey. Address Box X, Automobile Journal Office, Pawtucket, R. I.

NEW YORK SHOW EDITION

ACCESSORIES, PARTS AND SHOP EQUIPMENT NUMBER

The January Issue of the Accessory & Garage Journal Will Have a GUARANTEED DISTRIBUTION of 15,000, Reaching All Listed Manufacturers of Cars and Service Wagons, All Agents for Cars and Service Wagons, All Public Garage Owners and Managers, All Repair Shops, and All Dealers in Automobile Accessories and Supplies; All Active Purchasing Interests.

THIS NUMBER WILL REACH THE WHOLE TRADE. The Publisher's Sworn Statement, the Form of Which Is Attached, Guarantees to Every Advertiser That 15,000 Copies of the ACCESSORY and GARAGE JOURNAL Will Be PRINTED and DISTRIBUTED, a FULL 100 PER CENT. TRADE CIRCULATION VALUE.

The Edition Will Be an Encyclopedia of Information of Motor Vehicle Accessories, Supplies, Parts and Equipment; All of the Trade Will Preserve and Retain It for Reference. No Other Form of Publicity Can Equal It, or Be So Lasting. It Will Be a 1913 Trade Catalogue.

Advertisers Using One-Eighth to One-Quarter Page Space Will Be Entitled to Descriptions Not Exceeding 200 Words, with Illustration of Any Specified Product (Example Shown on Third Page), and for Each Additional Quarter Page Space Used Another Description and Illustration, Not Necessarily of an Article Advertised. Line Illustrations Will Be Furnished by the Publisher; Advertiser Must Furnish Half Tones. Cuts for Accessory and Car Equipment Illustrations Must Not Exceed Three Inches Length and Two Inches Width, and for Machine Tools, Shop Equipment, Etc., Must Not Exceed 3⅛ Inches Width. See Page 4 for Shop Equipment Data and Illustrations.

3 DISTINCT INDEXES---CONCERN, PRODUCT and TRADE MARK.

1. All Advertisers Will Be Listed Alphabetically in the ADVERTISERS' INDEX, Indicating Pages on Which the Advertisement, Descriptions and Illustrations Appear. See Example, Page 2.
2. All Advertisers Will Be Listed Alphabetically in the PRODUCTS INDEX, Classified by Products, Giving Addresses of Branches, and the Pages on Which Advertisements, Descriptions and Illustrations Appear. See Example, Page 2.
3. All Advertisers of Trade Marked Products and Those Whose Productions Are Described, Will Be Listed Under the Trade Name of Product in the DESCRIPTIVE and TRADE MARK INDEX, Giving Branch Addresses and the Pages on Which the Descriptions, Illustrations and Advertisements Appear. See Example, Page 2.

A Show Number With the Enduring Publicity of a Trade Catalogue.

Accessory and Garage Journal

TIMES BUILDING - - - PAWTUCKET, R. I.

Published by The Automobile Journal Publishing Company

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JACKS AND LIFTING DEVICES.

Hartford Suspension Company, 146 Bay St., Jersey City, N. J. Branches: 1700 Broadway and 212-214 West 88th St., New York, N. Y.; 325 Columbus Ave., Boston; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.; 803 Woodward Ave., Detroit, Mich.; 448-50 N. Capitol Boulevard, Omaha, Neb. Advertisement 95, Description and Illustration 53.

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LUBRICANTS.

New York Lubricating Oil Company, 116 Broad St., New York, N. Y. Branches: 126 Massachusetts Ave., Boston; 37 New Jersey Railroad Ave., Newark, N. J.; 407 Franklin Bank Building, Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; Spokane, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa. Advertisement 93, Description and Illustration 59.

TRADE MARK INDEX

BATTERIES, STORAGE.

Edison	Edison Storage Battery Company, Orange, N. J. Branches and represented in all principal cities.
Exide	Electric Storage Battery Company, Philadelphia, Penn. Branches: New York, Chicago, Cleveland, Denver, San Francisco, Portland, Ore.; Boston, St. Louis, Atlanta, Detroit, Los Angeles, Seattle, Toronto.

CARBURETORS.

Rayfield	Findeisen & Kropf Manufacturing Company, 21st and Rockwell Sts., Chicago, Ill.; George Summer, 1841 Broadway, New York, N. Y., and 745 Boylston St., Boston, Eastern Distributor. Agencies in all principal cities.

CHAINS, TIRE.

Weed	Weed Chain Tire Grip Company, 28 Moore St., New York, N. Y. Sold by all Dealers.

CHAINS, DRIVING.

Brampton	Chas. E. Miller, 97-103 Reade St., New York, N. Y. Branches: 202-4 Columbus Ave., Boston, Mass.; Bridge and Dwight Sts., Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York, N. Y.; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia, Penn.; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson St., Detroit, Mich.; 250 Peachtree St., Atlanta, Ga.; 601-3 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

CRANES AND HOISTS.

Portable Floor	Canton Foundry & Machine Company, Canton, O.

ELECTRIC LIGHTING SYSTEMS.

Dynalux	Dean Electric Company, Elyria, O.
Gray & Davis	Gray & Davis, Inc., 55 Lansdowne St., Boston, Mass.

FUNNELS, MEASURES, ETC.

Dover	Dover Stamping & Manufacturing Company, Cambridge, Mass.

GREASE GUNS.

B-Line	Randall-Faichney Company, Boston, Mass. Sold by All Dealers.

GAS TANKS.

Prest-O-Lite	Prest-O-Lite Company, 237 E. South St., Indianapolis, Ind. Branches and Service Stations in All Principal Cities.

HORNS, ELECTRIC.

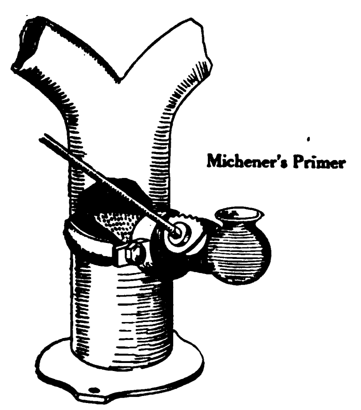
Newtone	Automobile Supply Manufacturing Company, 220 Taaffe Place, Brooklyn, N. Y. Sold by All Dealers.
Tuto	Dean Electric Company, Elyria, O. Sold by All Dealers.

LUBRICANTS, GREASES.

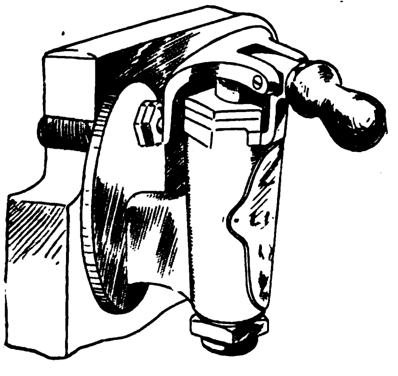
Colonial	Borne, Scrymser Company, 80 South St., New York, N. Y. Branches: Boston, Fall River, Mass.; Philadelphia.
Eagleine	Eagle Oil & Supply Company, 104 Broad St., Boston, Mass.
Harris	A. W. Harris Oil Company, 326 S. Water St., Providence, R. I. Branches: 148 N. Wabash Ave., Chicago, Ill.
Havoline	Indian Refining Company, 17 Battery Place, New York, N. Y. Branches: San Francisco, Chicago, Birmingham, Ala.; Cincinnati, O.; Lynchburg, Va.; St. Paul, Minn.
Monogram	New York Lubricating Oil Company, 116 Broad St., New York, N. Y. Branches: 126 Massachusetts Ave., Boston, Mass.; 37 New Jersey Railroad Ave., Newark, N. J.; 407 Franklin Bank Building, Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Mich.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; Spokane, Wash.; 117 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.
Motorol	New York & New Jersey Lubricant Company, 165 Broadway, New York, N. Y.
Non-Fluid	New York & New Jersey Lubricant Company, 165 Broadway, New York, N. Y.
Polarine	Standard Oil Company, New York, N. Y. Branches and Agents in All Cities.
Texaco	Texas Oil Company, 7 West St., New York, N. Y. Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Examples of Car Equipment and Accessory Descriptions.

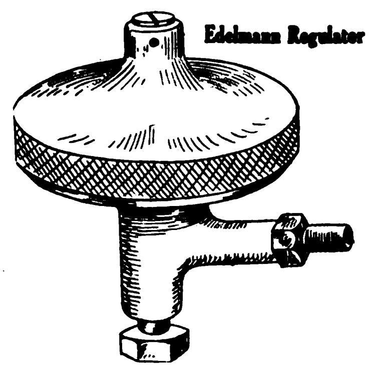
Michener's Gas Saver and Primer. This device, manufactured and distributed by E. S. Michener, New Castle, Pa., is designed for installation in the intake manfold of any internal combustion engine above the carburetor, to which it is attached by a brass strap and bolts and lock nuts. The primer is operated by a rod and linkage extending through the dash of the car or to a convenient place in a boat or engine room. A wire gauze cone is fitted in the device, through which the fuel gas is drawn from the carburetor, the mesh causing the heavy mixture to thoroughly atomize, greatly increasing its inflammability and adding to its power productiveness. In the heavy brass casing of the primer is a valve, that may be noted in the illustration, which is operated by the driver or engineer, and may be opened to any desired point to .5625 inch, permitting a wide variance of the fuel by this auxiliary air supply. A priming cup is made part of the device, so that in cold weather engine starting is facilitated. The claim is made for this instrument that it greatly reduces the fuel consumed. **Price, $5.**


Michener's Primer

Flash Auto-Lighter. The Flash Auto-Lighter, made by the Motor Specialties Company, Motor Mart, Boston, Mass., is designed for installation on motor cars to make and extinguish the lights of the head lamps by manipulation from the driver's seat. The system is simple and substantial and consists of a pair of special burners for the lamps, an induction coil and a controller, the last named being illustrated. The controller is a combination gas valve and electric switch, the two being operated by a single lever. With the throwing of the switch sparks are made at the burners before the gas valve is opened, and these continue until the lights are made. The coil is a single unit type, finished with mahogany and brass, and that the system may be entirely independent of the engine ignition the coil has four terminals for the primary and secondary wiring. The burners fit any standard lamp. The sparking points are rigidly clamped over the gas vents of the burners, and will not interfere with the light and cannot be separated by the vibration of the car. Turning the switch handle toward the left will make the lights instantly, and they may be extinguished by moving the handle to the right. The installation is furnished complete with gas pipe, unions, wire, terminals, etc. **The price is $20.**

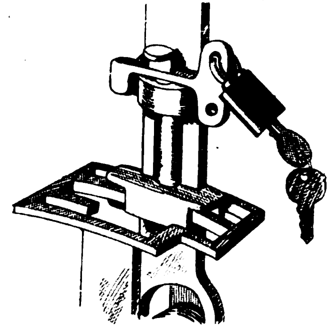

Flash Auto Lighter

Edelmann Regulator. An extremely useful device is the Edelmann Regulator, manufactured by S. Edelmann & Co., Chicago, Ill., which is intended for attachment to tanks in which gas is stored under pressure, that the flow of gas may be equalized and the pressure regulated. The range of adjustment is wide and it is possible to vary the pressure from two ounces, which is the head recommended for two three-quarter foot burners, to considerably more than a pound, though the extreme is seldom if ever required. The metal diaphram of the regulator has extremely long life. The adjustment is made by turning a screw in the cover of the device. **Price, $2.**

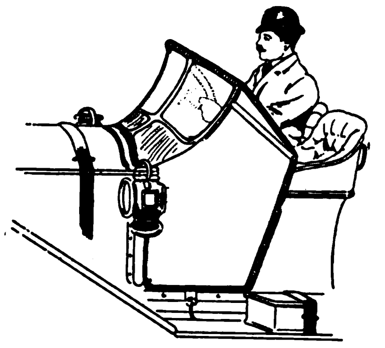

Edelmann Regulator

Saunders Auto-Lever Lock. F. H. Kelsey & Co., Cleveland, O., is producing the Auto-Lever Lock, a device intended to prevent the unauthorized use of a motor car, that consists of two parts. The one is the base, which is placed on the lever quadrant when the speed changing lever is in neutral and against the lever, so that the lever cannot be moved. To the lever is attached a clip that has two ears, in which are holes. When the base has been placed against the lever on the quadrant two holes in the upper part register with two holes in the ears of the clip on the lever, and through these the clasp of a heavy Yale lock is passed and it is possible to prevent the lever being moved until the lock is removed. The device is sufficiently strong to resist any ordinary attempts at theft. It is substantially made and should serve for a long period. It is furnished with keys in duplicate. **The list price is $5.**

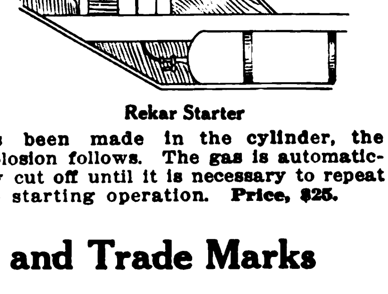
SAUNDERS' AUTO LEVER LOCK



Auto Windshield. The Auto Windshield, made by the Auto Wind Shield Company, Cambridge, Mass., is an exceedingly practical device. It is extremely light, affords a very large measure of protection for the occupants of a car, may be removed whenever desired in a very few minutes, and easily replaced. As may be noted from the illustration, it is a form that will insure comfort for the driver. It is built with a metal frame that is supported by brass fittings, and the frame is covered with a fabric impervious to wind or water. In the front are two large sheets of a transparent material, through which the road may be seen, and which is said to be unbreakable. The shield may be used without the sides if desired. The shape of the shield is said to be such that the current of air is deflected above the heads of the passengers. **Price, $35.**


AUTO WIND SHIELD

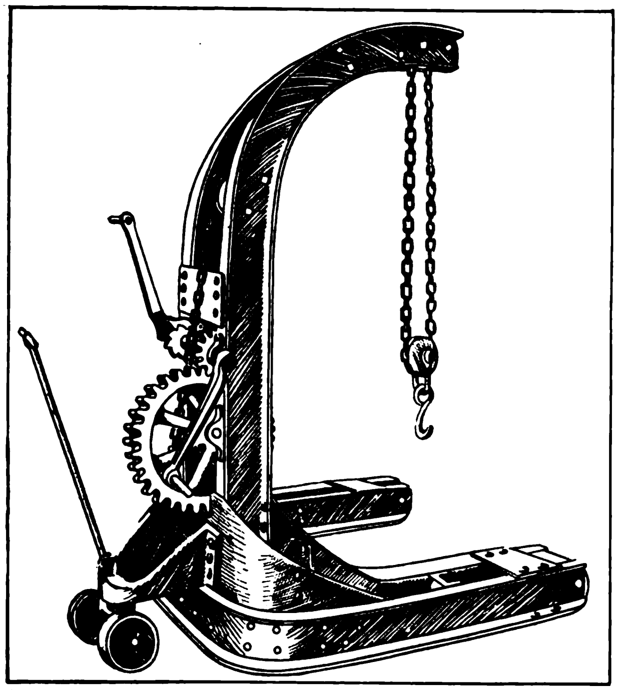
Rekar Automatic Starter. An extremely useful device is the Rekar Automatic Starter, manufactured by the Rekar Automatic Starter Company, Sixth and Market street, San Francisco, Cal., a system by which a charge of acetylene gas is introduced into the cylinders of a motor and fired, this giving the initial impulse necessary to insure operation. A controller is attached to the dash of the vehicle and there is a system of tube to the engine cylinders and to the gas tank. This controller is substantially made and it is installed convenient to the operator of the car. There is a system of wiring connecting the ignition battery and the controller. Normally the controller is as seen in the illustration, with the plunger rod projecting sufficiently for instant operating, yet not so that it interferes with the use of robes or prevents freedom of movement of those occupying the front seats, or entering or leaving them. The operation is by pushing a rod or piston in the controller by the foot or hand, this forcing a charge of gas to the cylinders. As this is done after the spark has been made in the cylinder, the explosion follows. The gas is automatically cut off until it is necessary to repeat the starting operation. **Price, $25.**


Rekar Starter

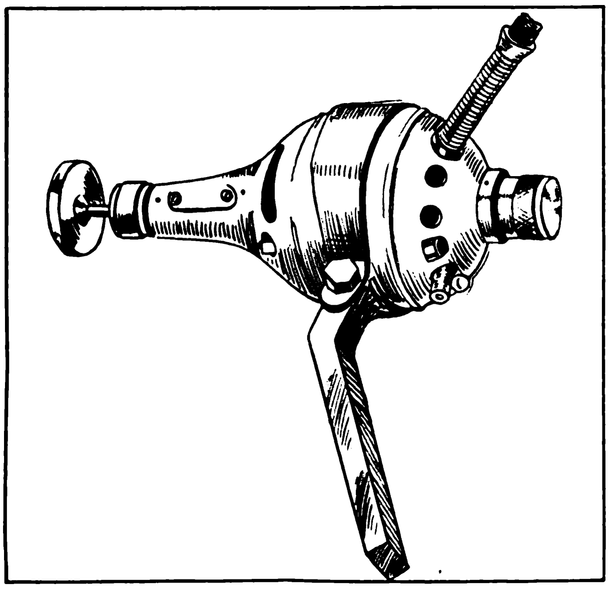
Examples of Machine and Shop Equipment Descriptions.

LAFAYETTE PORTABLE CRANE.

The Lafayette Engineering Company, Lafayette, Ind., is building a portable crane that is particularly suited for garage and repair shop service, and it is claimed that with it any man may handle work that would be quite beyond several men, and to decidedly economize in time as well. The crane is made of heavy steel channels and angles that are assembled with machine driven rivets, insuring a very durable construction. The feet of the base are long and may be extended under a chassis or object so as to insure certain stability, and as the crane has an overhang of 3.5 feet it can be used from practically any position about a vehicle chassis. The base is mounted on wheels fitted with roller bearings, so that even with a load the crane may be moved with ease on any floor. The weight is about 900 pounds. The lift is a chain hoist operated by a series of gears, but little manual labor being required to lift any practical weight, and the safety of the material lifted is guaranteed by the testing of the chain to endure a weight of three tons. **The price is $——.**



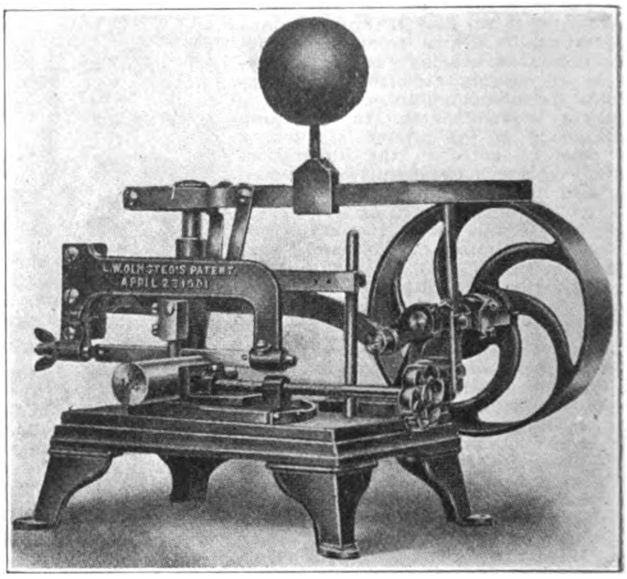
Lafayette Portable Crane.



Hamilton-Beach Grinder.

HAMILTON-BEACH GRINDER.

A tool of extreme serviceability in a garage or repair shop is an electric grinder, manufactured by the Hamilton-Beach Manufacturing Company, Racine, Wis. Being portable, it may be used wherever desired, and its efficiency is all that could be desired. This tool may be utilized for grinding dies, reamers, cutters, etc., and gives equally good results with external as with internal work. It is claimed by the maker that a quarter-inch hole may be ground to a depth of four inches with absolute precision, as there is no vibration and the construction is sturdy. Any kind of a wheel may be used, and felt or oil stone can be fitted when extremely fine finish is required. The grinder is operated by electricity and the current may be either direct or alternating. The motor is 1-12 horsepower and the grinding wheel is driven 10,000 revolutions a minute. The motor is air-cooled and it is capable of sustaining a large overload without heating. The outer casing is aluminum and the bearings of nickel babbitt are dust proof. The armature is ground on centres to a fine finish, and it is mounted in main and with end bearings that are adjustable for wear. The tool is furnished with a special cord 10 feet in length and a plug that may be fitted to any electric lamp socket. It may be used with a cable of any length. **The price is $35.**



Olmsted Power Hacksaw.

OLMSTEAD POWER HACKSAW.

L. W. Olmsted, Hasbrouck Heights, N. J., manufactures a line of power hacksaws that are adapted for garage and repair shop service and for either heavy or light work. Where even a few mechanics are employed the time required for cutting stock is considerable, and when the broken blades are accounted it is cheaper in every way to have the work done by machine. The value of these tools is in the fact that work can be placed in them and will be completed accurately without further attention. The type that is illustrated is designed to take stock up to 1.25 inches, either round or square, and it may be attached to a bench or table and driven from the main shaft if this is desired. It is fitted with a clutch for stopping or starting and a swivel device permits sawing at any angle. The driving pulley is six inches diameter and it should be turned 175 revolutions a minute in normal speed. The weight of the tool is 16 pounds. **The price is $——.**

THE ACCESSORY —AND— GARAGE JOURNAL
Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., NOVEMBER, 1912. No. 7

SALE DATE SET FOR JANUARY 8.

Judge Hough Calls for Bids for United States Motor Company's Property---Flanders Expected to Head Reorganized Concern---New Men and Capital for R-C-H Corporation---General News of the Industry.

According to the Wall Street Journal, Walter E. Flanders, at present president of the Flanders Motor Company, Detroit, has signed his acceptance of the presidency of the reorganized United States Motor Company. Publicity issued by E. Le Roy Pelletier of the Flanders company would seem to bear out this statement. It is understood, however, that the move is contingent upon the successful issue of present plans.

At the adjourned hearing before Judge Hough in the United States District Court in New York City, Nov. 18, the demurrer filed by certain minority stockholders was overruled. A tentative decree of sale was ordered to be amended in certain minor details. Bids may be filed with the receivers, 61st street and Broadway, New York City, until 10 in the morning of Jan. 8, and will be opened by Judge Hough at 11.

The tentative decree provides that the property of the present company shall be offered for sale in six parcels, that of the several companies involved being separated as follows: United States Motor Company, Alden Sampson Manufacturing Company, Brush Runabout Company, Columbia Motor Car Company, Dayton Motor Car Company and Maxwell-Briscoe Motor Company.

The report of the receivers was filed early in the month and presented the following summary:

AGGREGATE ASSETS.

Real estate, buildings and equipment, estimated value as a going concern	$5,119,356.31
Furniture and fixtures	76,000.00
Inventories, estimated as going concern with all factories operating except Brush	4,500,000.00
Accounts receivable	550,000.00
Notes receivable	34,830.20
Cash in hand and on deposit	412,027.80
Cash, special fund to provide for dealers' deposits	62,513.24
Prepaid expenses, insurance premiums, unexpired portions	45,440.21
Total assets, other than inter-company accounts	$10,800,167.76
Inter-Company Accounts.	
Entire debt so far as unassigned	$1,198,769.54
Notes receivable	2,000.00
National Motors Company	4,042.23
Providence Engineering Works	....
Total assets, other than securities, going concern value	$12,004,979.53
Securities.	
Briscoe Manufacturing Company	$367,995.00
Providence Engineering Works	1.00
E. R. Thomas Motor Car Company	....
Courier Car Company	....
National Motors Company	355,190.07
Total assets, estimated value	$12,728,165.60

AGGREGATE LIABILITIES.

Real estate mortgages	$164,540.90
Debenture bonds, bond scrip and interest	6,161,509.87
*Notes of one or more subsidiary companies, indorsed by the United States Motor Company, and notes of one or more selling branches, similarly indorsed, with interest	2,194,258.12
Notes of United States Motor Company, indorsed by one or more subsidiary companies	650,820.99
Claims against United States Motor Company, of which approximately $100,000 is due for goods delivered immediately prior to receivership	1,961,875.99
Claim against Columbia Motor Car Company, or United States Motor Company, or both	91,789.60
Notes secured by sight draft on car shipments	63,691,26
Wages of employees and accrued expenses	74,256.30
Dealers' deposits, partly offset by accounts receivable	55,113.24
†Contingent liability on indorsement of notes of E. R. Thomas Motor Car Company	400,000.00
Providence Engineering Works, claim made for work performed (disputed) $138,532.26	....
Total liabilities, other than inter-company	$11,817,856.27
Inter-Company Accounts.	
Briscoe Manufacturing Company	$813,970.91
The capital stock of this company is owned entirely by the United States Motor Company and as it is regarded as solvent, this liability is taken at	....
Total liabilities	$11,817,856.27

Excess assets, estimated value as shown, over liabilities as shown	910,309.33
Total	$12,728,165.60

CAPITAL STOCK.

Outstanding, outside ownership, not included in this statement:	
United States Motor Company, preferred	$11,499,733.33
United States Motor Company, common	12,206,350.00
Columbia Motor Car Company, preferred	13,400.00
Columbia Motor Car Company, common	118,000.00
Total	$23,837,483.33

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*It is estimated that the branch selling houses can pay $756,226.18 on their notes, after providing for local indebtedness.

†The receivers of the E. R. Thomas Motor Car Company estimate that that company will pay from 25 to 40 per cent. to its creditors.

BECOMES EASTERN SALES MANAGER.

E. A. Welch Takes Charge of the Distribution of Michigan Cars in This District.

E. A. Welch, Eastern Sales Manager, Michigan Motor Car Company.

Continuing its policy of surrounding itself with some of the best men in the industry, the Michigan Motor Car Company, Kalamazoo, Mich., has added to its sales department, E. A. Welch, one of the best known and most successful salesmen of the middle west. He becomes sales manager for the middle and eastern states, his territory including all the district east of a line extending from Chicago to New Orleans. He will reside in Kalamazoo and travel throughout the entire district, calling on distributors and dealers and establishing and supervising agencies.

Mr. Welch was for many years a successful merchant in Kalamazoo. Later he was in the tea and coffee business, with Dwinnell-Wright, from which firm he went to the Clark, Coggin & Johnson Company, and severed his connection with that concern to join the Michigan. His administrative ability commanded wide respect, and at one time he was offered the wardenship of the Michigan state prison at Jackson. He has a wide circle of friends, both in and out of the industry, and is particularly well known among the Elks, where he is much sought after as a toastmaster of social functions. The Michigan Motor Car Company is assured of a valuable assistant in Mr. Welch's appointment.

R-C-H STRENGTHENS POSITION.

Two New Men for Vice President and Treasurer and Additional Directors Named.

The R-C-H Corporation, Detroit, maker of R-C-H cars, has secured additional financial support and will be enabled to take care of its business, which has grown too rapidly for the amount of capital invested. The creditors and stockholders were recently called into consultation and the company's financial condition was frankly stated in a report compiled by McPherson, Weiss & Co., expert auditor and accountant. This report showed an excess of assets over liabilities of $576,000.

As a result of this conference a plan was evolved which will permit the business to be extended. The board of directors was increased from three to nine, and the following were selected: J. W. Hartz, John Kelsey, R. C. Hupp, F. M. Randall, J. H. Clarke and C. P. Sieder of Detroit; G. W. Rogers and J. G. Robertson of Akron, O., and C. G. McCutchin of Jackson, Mich. At a meeting of the directors later, the following officers were elected: President, R. C. Hupp; vice president, C. P. Sieder; treasurer and general manager, J. F. Hartz; secretary, L. G. Hupp; assistant general manager, F. R. Bump. The active management of the concern rests with an executive committee of five composed of Messrs. Hartz, Kelsey, Randall, McCutchin and R. C. Hupp.

The new vice president is president of the Sieder Manufacturing Company, and one of Detroit's most successful business men. The new treasurer is president of the J. F. Hartz Company and a director in a number of other Detroit concerns. He became actively associated with the automobile industry four years ago when he organized the C. M. Hall Lamp Company. Mr. Bump was formerly sales manager, and as such built up a strong sales organization which sold 7000 cars during the first year of business and has contracted for the sale of 16,500 machines during 1913. Before his connection with the R-C-H Corporation he was sales manager for the H. H. Franklin Manufacturing Company, Syracuse, N. Y.

NEW PATHFINDER FACTORY.

Motor Car Manufacturing Company Finds It Necessary to Secure Additional Space.

The increased demand for Pathfinder cars has impelled the maker, the Motor Car Manufacturing Company, Indianapolis, Ind., to acquire additional facilities for handling its 1913 production. The decision made it necessary that workmen should be employed night and day in completing the new plant, adjoining the present factory on Division street, West Indianapolis, and but a short distance from that of the Nordyke & Marmon Company.

The new structures are two stories in height, with an office building facing Division street. They are constructed of brick, glass and steel, and the working floor space is paved with cement. Communication will be had with the present building, and new improved machinery will be installed throughout. The bilateral system of lighting will be employed, and elevators will connect all the floors. The office building will be furnished with modern equipment and one of the features of the plant will be a factory showroom, in which all the Pathfinder models will be placed on display.

G. O. Simons, Factory Manager Motor Car Manufacturing Company.

The above illustration presents G. O. Simons, factory manager of the company, who is well known throughout the industry. That he is held in high esteem by his associates is borne out by his recent election to the directorate of the Indiana Automobile Manufacturers' Association. He is a firm believer in pathfinding tours, in which the Pathfinder cars have taken a prominent part, and will assist Carl G. Fisher in the proposition to establish a national highway to the Pacific Coast.

AMES LINE FROM KENTUCKY.

Well Known Carriage Maker Enters Automobile Industry with Two Models on One Chassis.

The Ames Motor Car Company, Owensboro, Ky., with paid in capital of $100,000, an offshoot of the F. A. Ames Company, which has manufactured fine carriages for 30 years, has placed upon the market a new line of automobiles in which there are two models, a touring car and a roadster. George W. Yeoman, formerly general sales manager of the Continental Motor Manufacturing Company, has complete charge of the building of the Ames cars, and Charles T. Smith is general superintendent.

NEAL RETIRES FROM PRESIDENCY.

Becomes Chairman of Directorate While Nash Heads General Motors Company.

After a two years' term as president of the General Motors Company, Detroit, during which time a successful reorganization has been accomplished and the big company has been re-established on a profitable and stable basis, Thomas Neal is relinquishing that office to become chairman of the board of directors. He will be succeeded by C. W. Nash, for some time past manager of the big plant of the Buick Motor Company, Flint, Mich., one of the constituents of the parent organization.

The move is strictly in keeping with the understanding between Mr. Neal and the company when he took office. In the fall of 1910, when the big concern was refinanced and the executive offices were moved from New York to Detroit, the financial interests supporting the company realized the necessity of securing as president a man of very broad business experience. Mr. Neal was approached and urged to take the office, but he accepted with some hesitancy, because of the personal sacrifice involved, and only on condition that he might be permitted to retire at such time as the business was re-established on a satisfactory basis. When it is known that the General Motors Company was able to show a net earning of over 17 per cent. on the common stock during the past year, there can be little doubt that the task has been accomplished.

Under Mr. Neal's administration the company has concentrated its manufacturing operation at plants where large volume of production is possible. The result of this policy has been to make every plant an earner. The Cadillac, Buick, Oakland, Oldsmobile and Cartercar plants are all working to their fullest capacity to supply the trade which these well known cars have built up. All of the factories manufacturing accessories are enjoying similar prosperity, as well as the plant of the General Motors Truck Company at Pontiac, Mich., still another subsidiary.

To his many friends, Mr. Neal is best known as a man of domestic tastes, who derives his greatest pleasure from his home life, for the enjoyment of which the past two years have given him but little time. It will be a source of much gratification in the industry to learn that he is to retain his connection with the company and will serve in a definite and official capacity as chairman of the board of directors.

Thomas Neal, Retiring President, General Motors Company.

HEADS NATIONAL SALES FORCE.

J. M. Clarke Has Had Abundant Experience to Qualify Him for Position He Holds.

Few men connected with the automobile industry are called upon to play a more important part in the success of the company with which they are connected than the sales manager of a large factory. Of course it is essential that he should be backed by a good car, but the disposition of the product is strictly in his charge. J. M. Clarke is sales manager for the National Motor Vehicle Company, Indianapolis, Ind., maker of National cars.

Mr. Clarke is eminently well qualified for his position, particularly as he has been connected with the industry since 1899, when he was associated with the Electric Vehicle Company, Hartford, Conn. He left that company in 1900 to spend the better part of two years with various factories in Europe. From 1902 to 1905 he was with the Pope Manufacturing Company, Hartford, Conn., and from 1906 to 1908 was connected with the retail sales business. He joined the National sales force in 1909. It will thus be seen that Mr. Clarke has had abundant experience both as a factory man and dealer, enabling him to keep in close touch with the sales organization.

J. M. Clarke, Sales Manager, National Motor Vehicle Company.

ADDING ANOTHER BUILDING.

Electric Auto Lite Company of Toledo Finds Imperative Need for More Room.

With the approach of 1913, the first year in which general complete equipment is the rule with automobile manufacturers, producers of accessories find themselves in urgent need of more factory space. The Electric Auto Light Company, Toledo, O., has found it necessary to erect an addition to its plant at 133-135 Michigan street, which will provide 40,000 square feet of floor space. The work already is under way and the concern expects to be installed in the new structure before the first of the year.

The Electric Auto Lite Company manufactures a new combined electric lighting and starting system for motor cars. The device, which will be included in the standard equipment of many machines for 1913 and 1914, is operated by a foot button in the floor of the car. The officers of the company are: President, Artemus W. Fisher; secretary and treasurer, Clement O. Miniger; manager, Sherman L. Kelly.

WILL MARKET NEW CAR.

King Company to Be Reorganized and Produce Model Designed by Bayerline.

Artemus Ward, the New York capitalist and member of the advertising firm of Ward & Gow, who recently purchased the plant of the King Motor Car Company, Detroit, will reorganize the concern on a more extensive scale. His son, Artemus Ward, Jr., will be connected with the new company. The reorganization will embrace some innovations and the concern will be a close corporation, limited to those now employed in the works.

The work of finishing all the stock of the King company will be carried out and a new car designed by J. G. Bayerline, who is general manager, will be placed on the market. Other officers of the proposed concern will be: President, J. G. Bayerline; superintendent, T. A. Bollinger; purchasing agent, J. B. Siegfried; factory foreman, J. Mohrhardt; sales manager, W. L. Daly; chief engineer, E. S. Chase. F. A. Vollbrecht will have charge of the accounting and George Gurney the service department.

NEW FORD POLICY.

Plan Evolved to Protect Dealers in Their Territories and Prevent Price Cutting.

In an effort to eliminate price cutting and to protect dealers in their respective territories, the Ford Motor Company is taking full advantage of its patent rights by affixing to every Ford car that leaves the factory a special restrictive patent license plate. This is mounted on the dash, just above the steering post, and after giving a list of the Ford patents, reads as follows:

"This Ford car is sold subject to restrictions as to price at which and territory within which it may be sold or delivered. Any violation of such restrictions makes the seller or user an infringer of said Ford patents and the title of this car reverts to the Ford Motor Company. The purchaser of this Ford car agrees at time of purchase to register his or her name, address, date of purchase and above car number with the Ford Motor Company at Detroit, Mich., U. S. A., as the owner of this automobile in order to be protected under the warranty of the manufacturer."

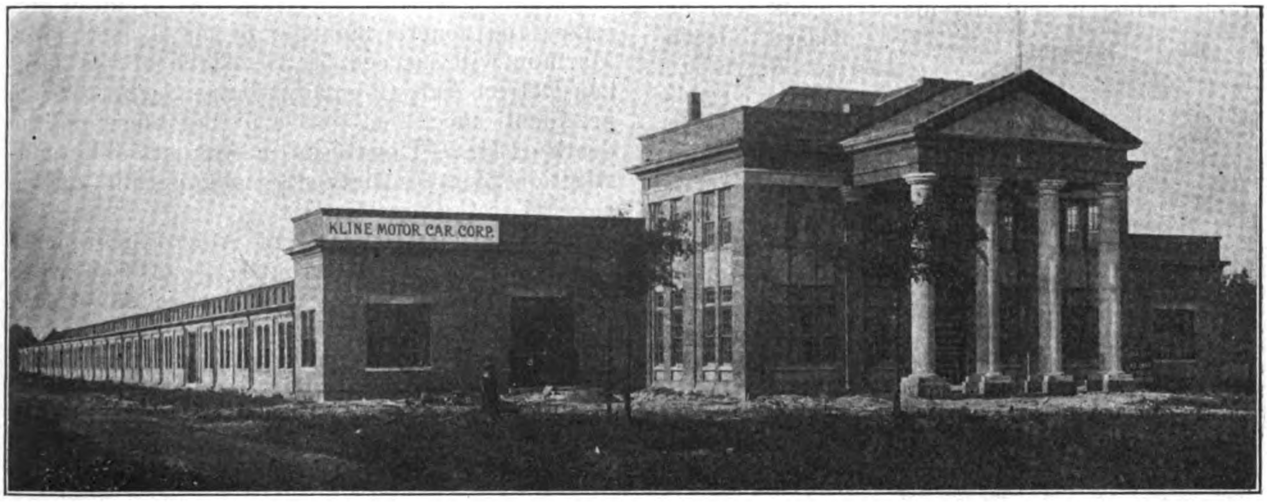
OPENS VIRGINIA PLANT.

Kline Motor Car Corporation Transfers Bulk of Its Business from York, Penn.

The new factory of the Kline Motor Car Corporation on a 15-acre tract in Richmond, Va., has been opened, and for the past month machinery and other factory equipment has been shipped from the old plant in York, Penn. It is not the intention of the company to abandon the York factory, but this will be maintained as a service station and sales branch.

The new building is shown in an accompanying illustration. It was erected at a cost of more than $100,000 and is fully equipped with all modern manufacturing facilities. About 750 men will be employed at first, but it is expected that the force will be augmented in the near future.

The factory is built in two parallel wings, connected at the end by a shorter wing, in front of which and joined to the rest of the plant is the 2.5-story office or administration building. Each of the main wings is 600 feet long and 60 feet wide. They are 1.5 stories in height, the upper portion being covered with a cone shaped roof, on either side of which are adjustable windows, operated from the factory floors by rods, thus affording excellent light and ventilation. The connecting structure between the two main wings is the same height and construction, and is 30 feet wide and 60 feet long. Within the court are the tracks of the Seaboard Air line, over which shipments will be made.



New Factory of the Kline Motor Car Corporation at Richmond, Va., Covering a Tract of 15 Acres.

The office building is of the Colonial type of architecture. Each floor is 30 feet wide and 60 feet long. Extending out from the eaves of the roof and supported by four white stone columns is a port cochere, covering a driveway which leads to the main entrance of the general offices. The officers of the corporation, the general manager and the purchasing agent will be located on the first floor, while the sales manager, advertising manager, engineer and other department heads will be on the second.

JOINS REMY ELECTRIC COMPANY.

Well Known Authority on Starting and Ignition Apparatus Becomes Consulting Engineer.

O. F. Conklin, for 16 years chief engineer of the Robbing & Myers Company, Springfield, O., and a well known authority on electric starting ignition systems, has become consulting engineer of the Remy Electric Company, Anderson, Ind., maker of Remy magnetos. It is understood that he will have charge of the design and construction of the new Remy electric starting device for application to automobile engines.

The Remy company also announces the appointment of P. E. Kempton of San Francisco as manager of the San Francisco Remy branch to succeed A. J. Rogers, who becomes manager of the New York branch in place of F. M. Henkel, resigned. W. F. Hamilton, formerly assistant manager of the Indianapolis branch, becomes assistant manager of the San Francisco branch and is succeeded at Indianapolis by A. H. Berndt, who has been connected with the sales department of the company for several months.

The concern is particularly busy, several large orders for 1913 equipment having been received for early delivery. One of these calls for a car load of Remy magnetos a week for the Willys-Overland Company, Toledo, O., maker of Overland cars.

ST. LOUIS TIRE FIRM.

New Concern Organized to Produce Equipment for Both Pleasure and Commercial Cars.

The St. Louis Tire & Rubber Company, with capital of $150,000, has been organized in St. Louis, Mo., for the production of tires for both pleasure and commercial vehicles. J. A. Swinehart, formerly associated with the Swinehart Tire & Rubber Company, Akron, O., has been active in the formation of the company, and this fact led to the original assumption that the Swinehart company was interested in the move. It is stated, however, that he has severed his connection with the Swinehart company and that the two concerns will have absolutely separate identity.

Among the St. Louis men associated with Mr. Swinehart are the following:

Nelson W. McLeod, Alfred C. Einstein, Morris Eisenstadt, Roy F. Britton, H. L. Parker, William H. Glasgow, C. C. Collins, William T. Jones, Eugene B. Stinde, Charles M. Skinner, H. C. Barker, H. L. Philo.

PEVEAR TO HAVE OWN AGENCY.

Well Known Advertising Man to Head New Concern Established in Rochester, N. Y.

Few men have enjoyed more success in the merchandising field than T. F. Pevear, who has just purchased the magazine business of the Myers Advertising Agency in Rochester, N. Y. Mr. Pevear is a young man well known in the automobile industry, and his many friends will be pleased to learn that he is to conduct his own agency in the future under the name of Pevear & Co.

T. F. Pevear, a Successful Advertising Man.

In 1905 he made his first appearance in the advertising field as an independent copy writer in Providence, R. I. In 1907 he took charge of the advertising department of the Shepard Company in that city and left Providence in 1909 to accept a similar position with the McCurdy & Norwell Company in Rochester. This department store experience proved particularly valuable to him when he decided to enter the agency field. In 1910 he joined the Myers agency, and his energy and keen insight into the various phases of advertising won him the promotion to become secretary the following year.

With his purchase of the old concern comes the announcement that he will devote his personal attention to the handling of campaigns involving wide publicity. A new suite of offices has been opened in the Cutler building, and associated with Mr. Pevear will be: Ralph H. Fulner, in charge of orders and estimates; Carl Raschen, art department, and F. A. Partenheimer, copy department.

ENGINEERS NOMINATE OFFICERS.

Howard Marmon Selected to Head National Society with Able List of Assistants.

Howard Marmon of Nordyke & Marmon Company, Indianapolis, Ind., maker of Marmon cars, has been nominated for the office of president of the Society of Automobile Engineers by the nominating committee. The officers of the society are elected by mail vote, the result of which will be announced at the annual meeting of the organization, which will take place in New York City in January. The nominees for the other offices follow:

Vice presidents, Russel Huff, Packard Motor Car Company, Detroit, and John C. Perrin, Lozier Motor Car Company, Detroit; treasurer, Herman F. Cuntz, Automobile Board of Trade, New York City; members of council, Eugene F. Russell, Locomobile Company of America, Bridgeport, Conn.; Harold L. Pope, Pope Manufacturing Company, Hartford, Conn., and Joseph A. Anglada. Coker F. Clarkson will remain secretary and general manager of the society. Mr. Marmon will succeed H. W. Alden of the Timken-Detroit Axle Company, Detroit, who, as vice president, succeeded to the higher office on the death of H. F. Donaldson in August. The constitution of the society does not permit of reelection to the presidency.

In addition to President Alden the officers who will retire are: Harold L. Pope, vice president; Herman F. Cuntz, treasurer; Henry May, Howard Marmon and Charles Ethan Davis, members of the council. The council members who hold over are: Charles B. Whittlesey, Hartford, Conn.; Arthur B. Cumner, Philadelphia, Penn.; Andrew L. Riker, Bridgeport, Conn.; Herman F. Cuntz, New York City; Howard E. Coffin, Detroit, Mich.; Henry Souther, Hartford, Conn.

WILL MAKE WALPOLE TIRES.

New Concern Organized to Take Over Business Formerly Conducted by Maine Corporation.

The Walpole Tire & Rubber Company has been incorporated under the laws of Massachusetts to acquire the good will, rights, property and assets of the Walpole Rubber Company, a Maine corporation. The capital of the new company is $4,500,000, of which $3,000,000 is 7 per cent. cumulative preferred stock and $1,500,000 common. The company will manufacture tires and all kinds of rubber goods at Walpole, Mass.

The preferred stock of the concern has no voting power and is retirable at the option of the directors at $120 a share and accrued dividends after five years from date of issue, in lots of $50,000 at a time. The incorporators of the corporation are: E. W. Tinkham, Harrisville, R. I.; A. T. Baldwin, Boston; F. J. Gleason, Walpole; E. C. Green, Boston; E. W. Furbush, Roxbury, Mass.; L. O. Dulcos, West Roxbury, Mass.; J. C. Blanchard, Jr., Boston.

TO PRODUCE KNIGHT MOTORS.

Stearns Company Has Acquired Rights to Manufacture These for the Trade.

Frank B. Stearns, president of the F. B. Stearns Company, Cleveland, O., which concern has been producing a Knight engined car for the past year or more, announces that the company is prepared to manufacture Knight engines for the trade. Under its agreement with Knight & Kilbourne, this right is understood to have been conferred upon the Stearns Company, and plans for putting it into force are said to have been under way for the past six months.

Recent factory additions have enabled the concern to make the present announcement, and it is stated that a number of car manufacturers have made arrangements for the Stearns company to supply them with motors. It is not known what effect this may have upon the future plans of the Lyons-Atlas Company, which recently purchased the business of the Atlas Engine Works, Indianapolis, Ind., formerly engaged in manufacturing Knight motors for the trade.

WILL MAKE SPECIAL WHEELS.

Cincinnati Concern Purchases Plant and Will Begin Operations in Near Future.

The Ideal Steel Wheel Company, Cincinnati, O., recently incorporated with a capital of about $500,000, has purchased the plant of the Seufferle Cooperage Company, on Spring Grove avenue, that city, paying, it is said, $41,000 cash for the property. The corporation, formed under the direction of the Kirgan-Parker Company, Cincinnati, will introduce a new method of utilizing the solid automobile tire, made possible through the manner in which the wheel is constructed.

The property just acquired, according to President J. B. Fitch of the company, will be enlarged at an early date. The main building is 200 by 226 feet, and there are several minor structures. As these are strongly built they will be utilized and connected with a large addition. Others interested in the company besides President Fitch are: Vice president, J. E. Strietelmeier, who is also the inventor; treasurer, E. H. Maffey; general manager, Harrie E. Walker.

CONCERN CHANGES HANDS.

E. E. Warner Retires from Milwaukee Motor Company but Will Act in Advisory Capacity.

The controlling interest and management of the Milwaukee Motor Company, Milwaukee, Wis., maker of automobile motors, have changed hands. E. E. Warner, for nine years president of the concern and owner of a majority of its stock, and C. F. Kaiser, secretary and treasurer, having sold their interests to retire. J. C. Coerper of Coerper Bros. Lumber Company, has become president; August John, vice president and general manager, and Henry John, secretary and treasurer of the reorganized company. J. D. Bowes, formerly vice president, still remains with the company as director, while Mr. Warner will for a time act in an advisory capacity.

The history of the Milwaukee Motor Company is one of prosperity. Organized by Edgar E. Warner nine years ago, it was capitalized at $10,000 and employed but a few workmen. Today it employs 350 and has under construction additions to the factory costing $78,000 which, when completed, will give employment to 500 skilled workmen. This increase was made necessary by the constantly increasing business. From the small beginning, Mr. Warner, by capable business methods, built up the concern until its present inventory is more than $400,000.

IS NEW FEDERAL EXECUTIVE.

Garvin Denby Appointed Secretary and Treasurer with Charge of Sales Department.

Garvin Denby, Treasurer, Federal Motor Truck Company.

Garvin Denby, prominent in business circles in Detroit and the East, has been added to the executive staff of the Federal Motor Truck Company, Detroit, maker of Federal trucks, his position being secretary and treasurer with general charge over the sales department. Mr. Denby is a salesman of proven ability and has achieved success in many past undertakings. His business career began in 1897 when he started with the Gilbert Wilkes Company of Detroit, in the electrical and mechanical engineering department. He passed two very successful years with this concern until the spring of 1899, when he was appointed attache of the first Philippine commission under Chairman Schurman, spending a year in the Insular possessions.

Mr. Denby left the government service in 1900, joining the forces of the Solvay Process Company of Detroit. He was appointed assistant in the soda ash department, where he was successful, being transferred in 1907 to the head offices at Syracuse, N. Y. His past excellent record resulted in his appointment as assistant to the president, which position he occupied until going with the Federal Motor Truck Company.

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FORD ON UNIFORM LEGISLATION.

Henry Ford, head of the Ford Motor Company, Detroit, in discussing the question of uniform motoring laws, sets forth his opinion as follows:

"If each state would but enact automobile laws regulating the speed at which the cars may be driven and then prohibit any secondary legislation by small towns or cities, the problem would be solved. A motorist would then be able to familiarize himself with the law, and would be able to meet its requirements if he desired. If he did not, then every owner of a car should be interested in getting the violator punished.

"When the townspeople see it no longer possible to harass the motorist by unfair laws and are assured that automobile owners in general are endeavoring to enforce the laws, then motorists will no longer drive many miles to avoid buying anything in the town, and the town in turn will make the motorist welcome."

A BRITISH WRITER'S VIEW.

Lord Montagu, editor of the Car, a British motoring print, who recently paid a visit to America, writes as follows in a recent issue of his magazine:

"In the United States there is at least one serious inconvenience to motorists which should be removed before long. Every state, and there are 48 of them, makes its own laws under which motor cars are run, issues its own orders as to speed limits and has a different system of regulations. In every state there is a speed limit, sometimes the same as and sometimes different from its neighboring states. Needless to add, everywhere in America, as elsewhere all over the world, these speed limits are habitually disregarded, because they cannot be enforced."

LICENSING OPERATORS.

There is abundant evidence that the legislatures of several of the states are to be called upon at their forthcoming sittings to take up the matter of licensing and examining operators of motor cars. It will appear from the accompanying table that very few commonwealths at present require anything in the nature of an examination from those who seek to drive as chauffeurs, and in most states the ownership of an automobile is held to be sufficient qualification for operation. Several seek to put an age limitation upon the driver. The whole situation is set forth in the table.

Irrespective of the demand for better regulation in this respect, motorists will do well to interest themselves in the bills which shall be presented for consideration. Organized motorists have been endeavoring to secure uniform motoring laws, and it would appear that there is ample opportunity to bring about such action in connection with this situation. If more stringent laws are to be passed, there is no reason why the several states cannot reach a common ground upon which to base their provisions. It may result in a readjustment of other sections looking toward a proper uniformity, if the matter is given sufficient attention at this time.

	Operator		Chauffeur		Exam-
State	Fee	Age	Fee	Age	ination
Alabama	..	16	$5.00	18	none
Arkansas	..	..	1.00	18	none
California	..	..	2.00	..	none
Connecticut	$2	16	2.00	16	yes
Delaware	5	16	5.00	16	none
Florida	..	..	2.00	..	none
Georgia	..	16	....	..	none
Illinois	..	..	5.00	18	yes
Iowa	..	15	....	..	none
Maine	2	16	2.00	16	yes
Maryland	2	*16	2.00	16	yes
Massachusetts	2	16	2.00	18	yes
Michigan	..	..	2.00	18	none
Missouri	..	..	1.50	18	none
New Hampshire	3	16	5.00	18	yes
New Jersey	†	16	†	16	yes
New York	..	18	5.00	18	yes
Ohio	..	..	2.00	..	none
Oregon	..	..	2.00	18	none
Pennsylvania	..	§18	2.00	18	none
Rhode Island	1	16	1.00	16	yes
Tennessee	..	..	2.00	..	none
Vermont	2	18	2.00	18	yes
Virginia	..	..	2.50	..	none
West Virginia	..	..	2.00	..	none

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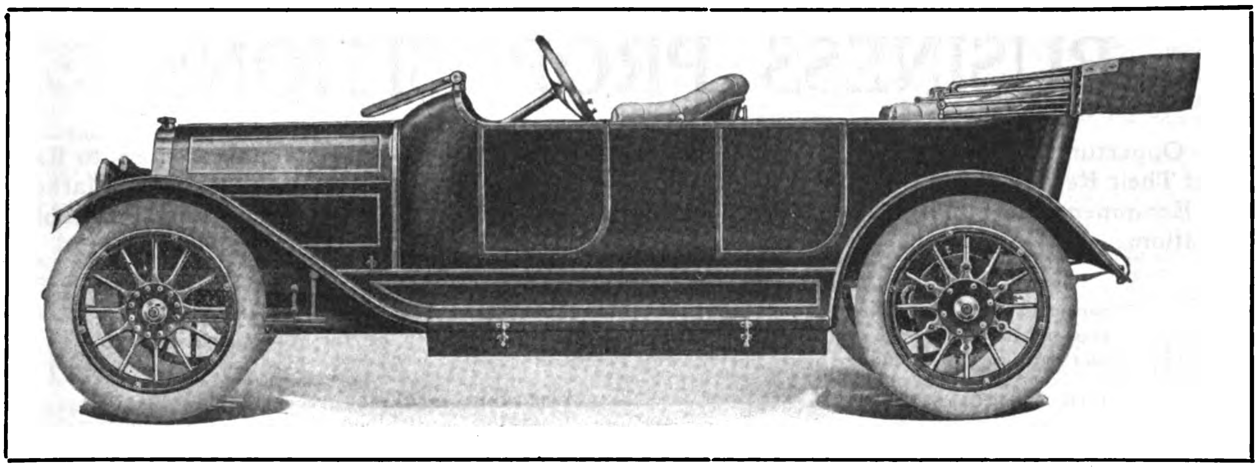
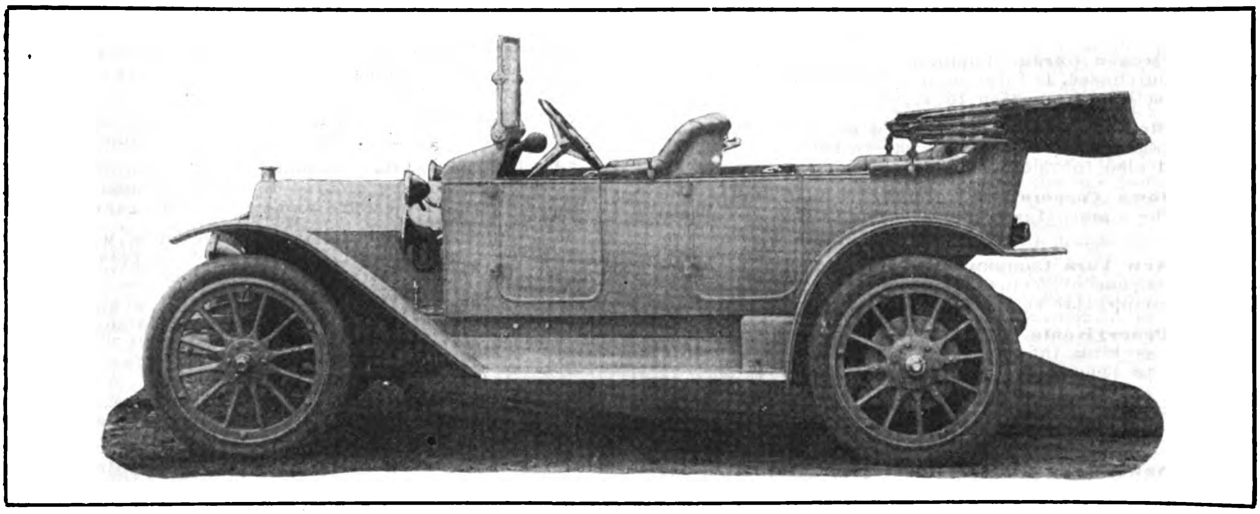
*Special license 14-16; †two classes of license, one for cars of 30 horsepower and the other for over 30; §special license for members of owner's family under 18 years.

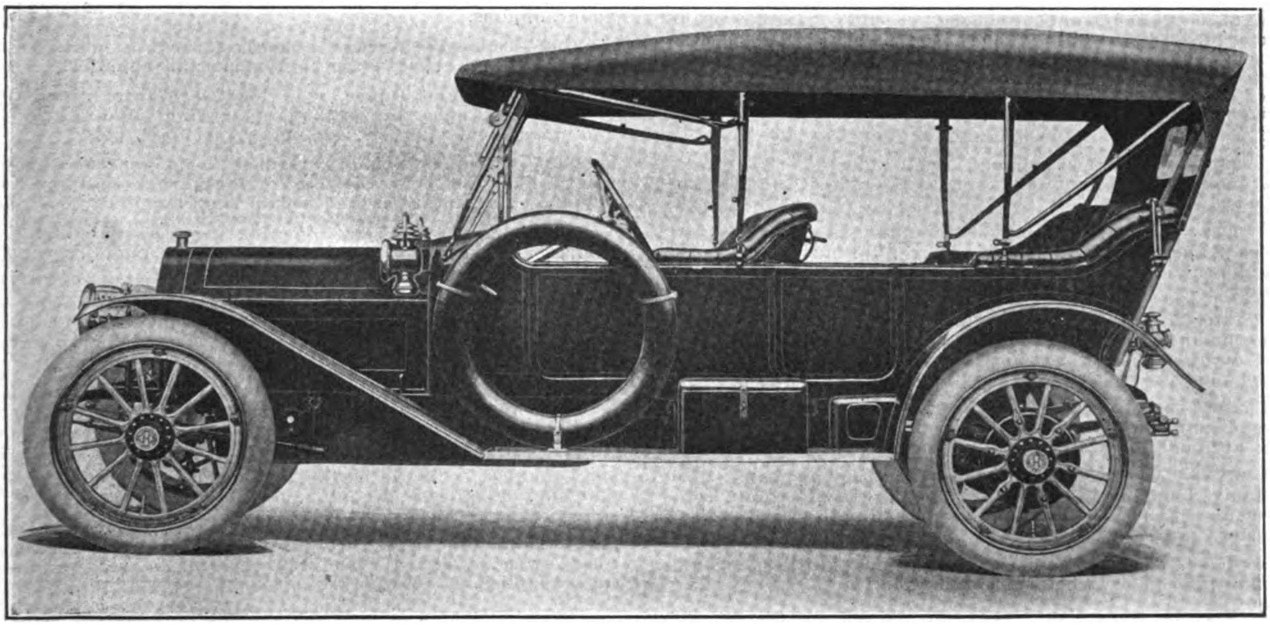
ATTRACTIVE NEW LINES FOR DEALERS.



Michigan "Forty," Made by the Michigan Motor Car Company, Kalamazoo, Mich.—Price, $1585, Including Equipment.



Lenox Four-Cylinder, 40-Horsepower, Made by the Lenox Motor Car Company, Boston, Mass.—Price, $2000, Fully Equipped.



Herreshoff Six-Cylinder, 36-Horsepower, Made by the Herreshoff Motor Company, Detroit, Mich.—Price, $1850, Fully Equipped.

TRADE INFORMATION EXCHANGE
BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding.

CAR AGENCIES DESIRED.

3243—New York Dealer desires the agency for motor trucks selling from $800 to $1500, gasoline or electric.

4267—Missouri Concern, recently formed, desires the agency for pleasure cars listing from $500 to $2000.

2385—Maryland House, just incorporated, will consider the agency for a line of pleasure cars listing from $1500 to $3500 and commercial vehicles from $1000 to $2500.

2001—Oregon Garage Company, enlarging a business recently purchased, is interested in the agency for pleasure cars selling from $800 to $1200.

2042—Montana Firm, located on a navigable lake, desires the agency for a pleasure car to sell from $700 to $2000, and also for motor boats.

6787—Iowa Corporation, recently formed, is in the field for the agency for a pleasure car selling from $800 to $2500.

6964—New York Company, now building larger quarters, is desirous of securing the agency for both pleasure and commercial vehicles at standard prices.

7677—Pennsylvania Firm, with new building completed, is seeking the agency for pleasure cars listing from $500 to $3000.

6056—California Concern, already handling standard trucks, is anxious to secure the representation of other lines of commercial vehicles to sell from $1500 to $5000.

6707—New Jersey Garage, building large addition to its plant, wants agencies for pleasure cars listing from $750 to $1400 and seven-passenger cars selling at $2000; also motor trucks listing from $750 to $1500.

6747—Minnesota Garage, which has changed hands, desires the agency for pleasure cars selling for $2500 and less.

6721—Pennsylvania Concern, recently established in new quarters, wants agency for pleasure cars listing from $500 to $2000.

ACCESSORY AGENCIES.

2674—Missouri Company, well located, will take agency for automobile supplies, equipment and accessories.

3852—Maryland Firm, engaged in accessory specialties trade, will take agencies for all kinds of pleasure and commercial vehicle accessories, equipment and supplies.

2679—Tennessee Concern, new corporation just starting business in new building, is desirous of securing lines of accessories and supplies of all kinds for commercial and pleasure vehicles.

2268—Michigan House, recently changed hands and undergoing extensive enlargement of scope, is interested in automobile accessories and supplies for the trade.

9768—New York Company, which has opened a new supply department for the automobile trade, would represent a general line of automobile supplies and accessories.

8160—Georgia Garage, doing a good business, would take agency for accessories and supplies.

8260—Montana Concern, occupying a new building for general automobile business, would like to secure agency for automobile supplies and accessories and commercial vehicle supplies.

7465—Indiana Garage, recently changed management, is interested in all kinds of pleasure and commercial vehicle supplies and accessories.

9664—New York Concern, about to build new, modern garage in tourist section, would take the agencies for supplies and accessories of all kinds for pleasure and commercial vehicles to supplement its good line of cars.

3019—Iowa Garage, just moved into new quarters and handling three lines of cars, is desirous of handling various kinds of supplies.

5601—California House, planning the erection of large garage establishment, is interested in accessories, supplies and equipment for power wagons.

7076—New Jersey Concern is seeking the agency for all kinds of supplies and accessories for automobiles.

7216—Pennsylvania Company, which has established new quarters, can be secured to handle accessories and supplies for both pleasure and commercial cars.

4677—Minnesota House, in good location, would like agency for a complete line of automobile accessories and for gasoline, oils, tires and other supplies.

6764—Kentucky Dealer, now handling a high grade pleasure car, is interested in accessories and supplies for pleasure cars and trucks.

EQUIPMENT NEEDED.

2680—Montana Company, which has just purchased a building to be remodelled into a general repair shop, is in the market for complete line of garage and repair shop equipment and supplies.

1608—Georgia Concern, about to enlarge its quarters, is interested in garage equipment of all kinds.

3645—Michigan Company, under new management and extending its business, is seeking a line of repair shop supplies.

2796—Tennessee Garage, recently formed, is interested in garage and repair shop equipment and supplies.

6828—Maryland House, well located, wants information of all kinds concerning repair shop and garage equipment and supplies, including machine tools.

4861—Missouri Company, formed to do general automobile business, is in the market for garage equipment, supplies, machine tools and repair shop supplies.

4766—Kentucky Firm, opening new establishment, desires information concerning garage supplies and equipment.

4785—Minnesota Concern, conducting an up-to-date business and handling two lines of pleasure cars, is desirous of securing equipment for garage, repair shop and salesroom to complete changes being made.

8573—Pennsylvania Company, in new quarters, wants machine tools, repair shop and garage equipment and supplies.

9211—Michigan Firm, which is to build a brick and steel factory, is in the market for machine tools and repair shop supplies and equipment of all kinds.

7584—New Jersey Garage, building addition to its plant, is in the market to purchase lathe, drill press, forge, grinder, etc., for running repairs, as well as garage supplies.

1105—California Concern, establishing business on a large scale and handling several lines of commercial vehicles, is seeking good supplies and equipment for garage and repair shop. Machine tools are needed.

7777—Pennsilvania House is in the market for equipment and supplies for its recently completed garage.

3911—Iowa Garage, recently moved into new building, is interested in garage and repair shop supplies.

7463—New York Company, which has purchased a site for a modern garage building, is in the market for all kinds of supplies and equipment for repair shop and garage.

6745—Indiana Firm, under new management, is seeking all kinds of first class garage and machine shop supplies and equipment.

6963—California Concern, actively engaged in the transportation of merchandise and freight, is in the market for power wagon equipment and supplies in general, also garage and repair shop equipment and supplies, including machine tools and mechanical equipment.

SPECIAL OPPORTUNITIES.

1425—New York Man is seeking information relative to concerns selling automobiles and accessories in Denver, Col., in which place he would like to locate as an agent for a good line that has a future in the trade.

3267—California Manufacturer, putting on the market a truck of undoubted quality, requires representatives of ability, particularly in the western part of the country.

4763—Massachusetts Concern is in the market for motor trucks and desires catalogues and information relative to gasoline and electric machines selling from $700 to $1200.

6734—Missouri House about to engage in taxicab business, desires full information concerning taximeters.

WHY PATENT PROTECTION BENEFITS EVERYONE.*

By Arthur P. Abbott.

In view of adverse criticism of the late decision of our courts regarding patent monopoly, it would appear that a defense of patent monopoly would be most unpopular. Yet it is a very rare occasion when any question does not have more than one side. And it is ignorance of the merits of the other side which frequently renders such questions unpopular. It is for this reason that educational campaigns on questions affecting a large number of people are most beneficial to all parties concerned.

In lines of trade requiring the selling of more or less patented merchandise, it is exceedingly important that dealers prepare themselves to meet the criticism offered by the consumer as to prices which patented articles frequently demand. And it is in hope of rendering the dealer assistance in such preparation that this article has been prepared.

The wisdom of Abraham Lincoln is best shown by his habit of soliciting opinions of parties having different viewpoints before forming one of his own. So in discussing this subject, which so seriously affects all classes, we shall not only present the views of those on the side of monopoly, but shall show, by a striking illustration, the validity of their claims.

As the careful analysis of any matter is important that it may be thoroughly understood, let us first trace the steps necessary to place any patented article in the hands of the consumer.

First is the inventor. The idea may have come to him in a flash, it may have been the outcome of accident or, as is more often the case, it is the fruit of years of brain-racking study, self-denial and expenditure of money, if not the dethronement of reason itself.

The second step is the appeal to our government to protect the rights of the inventor so that he may enjoy the fruits of his endeavor. In many instances this is the easiest step in the whole process. But in a large number of cases he finds that others have already appeared with the same or similar ideas, and unless he has funds, friends or an article of exceptional merit, his way is barred and all his labors go unrewarded.

But in looking at the matter in the most rosy light possible, if the invention has exceptional merit, he has only invited attacks from all sides. From those with capital who would, through infringement, if not absolute disregard of his so-called patent protection, proceed to place on the market the same or similar device. From other inventors who, discovering some loophole in his claims, devise some improvement which must be taken care of by purchase or royalty before the article can be properly placed on the market. And lastly, by the government itself, which by its lax methods, rulings and still more imperfect laws, gives him a license which is worse than useless as it leads him to believe he has protection which he has not.

It is not difficult to get "claims" allowed on most any device, and many "patent attorneys," after receiving a fee, which in many cases is contingent on a patent being granted, will use their knowledge of the lax conditions to put some claim by the examiners which, while it spells patent, does in no sense give protection.

No progressive, successful manufacturer today will accept patent papers from Washington at their face value. They require most careful search to be made to determine, not whether the article is patented, but how great will be the legal battle necessary to make the patent valuable.

The patent settled, so far as it can be before actual warfare is declared, the next step is to reduce the article to a marketable basis. While in this stage years are often consumed and frequently other patents are found necessary before the article can be successfully launched on the turbulent sea of commerce. More skill, more brains and a thousand times more money are required than in all the previous stages.

Some manufacturers, in their haste to reach returns, place articles on the market in imperfect condition with the result that the goods prove unsatisfactory to the consumer, unprofitable and annoying to the dealer and disastrous to the manufacturer. So those of most experience, prefer to test in the secret crucible of experiment till the dross has been extracted to the minimum.

When this has been accomplished, it would seem to the layman that the way is fully opened to successful and easy marketing. But on the contrary the real battle has scarcely begun. The public knows nothing of the device, does not feel especial need of its use, and if the price be above other articles on the market which, in an inferior manner, answer a like purpose, will be very slow in accepting.

For example: How many of us cling to the old hair pulling, skin slicing razor of our great grandfathers when a serviceable "safety" with automatic stropping ability is available? And all because we have not been induced to try or properly educated to use. In fact anything new is quite likely to meet with very cold reception from the general public before its merits have been demonstrated and properly exploited. So here comes the necessity of a long, costly campaign of education termed advertising. Fortunes are sunk in laying the foundation and in maintaining interest sufficient to reach a profit-producing stage.

"Surely now," says the layman, "you can sit back, put your feet on your solid mahogany desk, smoke your good cigars and watch your bank account grow." Not much. The battle is now on in earnest. The infringers are successfully battering down your defenses and must be repulsed. Grasping, dishonest dealers are cutting prices so as to dissipate not only their own profits, but the profits of legitimate and reputable dealers. Competitors are busy with schemes to get hold of your goods, where they have been defeated in producing them, that they may undermine profits and disorganize sales efficiency which has cost so much to build up. Then something new comes out and that which has cost you so much money and effort has, in a day, become a back number.

All this is not imagination or the dream of a pessimist. It is but the enumeration of some of the difficulties which beset nearly every article of great merit as all manufacturers of such can readily testify.

While all this trouble, expense and study may not interest the dealer and consumer, it does put us behind the scenes and show us first, that while the inventor is an important factor, he has only a small part in the production of the finished article. And secondly, that the dealer must depend largely on the manufacturer for protection in his efforts to market at profitable prices and in the education of the public to purchase. That if the manufacturer be negligent in his duties, the merchant will lose in profits. That the consumer, through ignorance of the merit of the article, will deprive himself of the blessings which inventive genius backed up by manufacturing ability does bestow.

Most of us are prone to look upon patented articles as a protected monopoly which force us to pay exorbitant prices above the actual cost of manufacture. We, as free-born American citizens, resent this and criticise the merchant who sells and the manufacturer who produces. We are ignorant of the great cost at which the article has been produced and placed in our hands that we might reap the benefits from those things which make living easier and life more secure. We are ignorant of commercial conditions which compel restric-

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tive selling methods that inventive talent may be encouraged and that legitimate dividends may accrue to those who have invested vast sums in its production and to those who have employed their capital in stocking and selling.

The results which would accrue from an attempt to market any new article of great merit, without patent monopoly, would not only be disastrous to the manufacturer, but the dealer as well. It would be like conducting a mercantile establishment without system or without the power to enforce system. A manufacturer who is unable to or who is neglectful in protecting by restrictions his product, is placed in the same position as the public official who is powerless or lax in the enforcement of the law. And those who obey the law are placed at a disadvantage to those who disobey. It is this phase of the question which has prompted our courts to rule favorably to those possessing valuable patented articles. There are good laws which at times work hardships on certain classes, but that all may be benefited in the greatest measure, their enactment and enforcement is necessary and just.

The right to control traffic, the right of society to protect itself against those things which tend to injure it are well recognized rights. So the right of those, possessing articles which tend to promote the public welfare, to regulate their sale that the article itself may be kept up to standard and that a proper educational campaign may be successfully and profitably carried on, should be as freely recognized. And this right should be restricted only where it can be shown that the consumer is being deprived of necessities on account of restrictions which make such articles prohibitive to certain classes. But so long as all classes are offered the article at a price in keeping with its value, and on terms which promote the best interests of the trade as a whole, any restrictions placed on their sale are not only legitimate but work for the common good.

Instances to illustrate the validity of these thoughts are so numerous that to use them would be to write the history of all manufacturers of valuable patented articles. So we will select from the number one which fully illustrates all phases of the subject.

The Weed Chain Tire Grip Company of New York City, some years ago purchased a patent on a device for preventing automobile wheels from skidding. After perfecting this invention, it discovered another patent which, in a manner, made its patent an infringement. It became necessary to purchase the other patent in order that it might produce an article on which it could offer valid protection to the dealer and consumer.

After spending large sums of money perfecting the device and preparing machinery to manufacture it, it began offering its goods to the public. It was something new and something which was to be used on an article which was, in a manner, in the pioneer stage—an automobile. Owing to the failure of previous devices to fill the need, the public was skeptical as to the efficiency of this device. So there was but one thing to be done and that was to begin an expensive campaign of education calling for not only thousands but hundreds of thousands of dollars. Advertising experts, costly pages of magazines, the product of skilled artists and the most painstaking and matured judgment of campaign managers, all demanding vast sums to successfully accomplish the end, namely to convince the public that the device was not only not in a class with others, but was effective and positive in its results.

As automobiles became more common, accidents from skidding tires began to multiply. Lives of not only users of cars but of the "innocent bystanders" were being sacrificed and all because of neglect to use what was already available, an efficient, simple and comparatively inexpensive device.

Municipalities began to take notice and lead the way by adopting them to publicly owned and operated cars. Gradually the far-reaching advertising and educative campaign began to show results. Weed chains began to sell not only by dozens, but by carloads. The public began waking up to not only the need but the efficiency of this device.

Then began the battle with infringers, cut price dealers and others, who by some device or other tried to evade the patented rights of the Weed company. And as expensive as was the advertising campaign it was carrying on, the patent warfare which followed far overreached it. Patent experts, costly and talented attorneys, detectives, witnesses who often were transported from long distances at the company's expense, all consumed money with appalling rapidity.

But they have finally fought their way through the courts and have at last won a complete victory. However, the battle is not ended by any means. Their guarantee of protection to the dealer calls for constant vigilance and sales restrictions which may seem to some to be unjust. But their guarantee of protection means just what it says and only so because of the careful restrictions which they have placed around their sales, the constant watchfulness they maintain on sale of infringing goods, the prohibition of price cutting, and the promptness with which they bring offenders to account.

The result is that while they have established a monopoly backed by a basic patent which has been thoroughly tried out in the courts on an article of merit and necessity, they have lowered their prices to the public as fast as consistent with reasonable profits. Not only this, but they have, by their sales restrictions, made it possible for dealers to handle an article with established demand and ready sale at a remunerative profit. There is no haggling of price as each package contains retail prices in printed form.

As we have before stated, this is only one illustration, but it is an example of what hundreds of other manufacturers are doing to establish better trade conditions and to serve the public with commodities which make for better living and the safeguarding of human lives and property.

When dealers and consumers become acquainted with this policy and appreciate the costly struggles that are made to protect and place on the market patented articles of public necessity at fair prices, all criticism will cease, and as soon as our government appreciates the necessity of making its patent licenses more protective, the consuming public will pay less for both necessities and luxuries and trade restrictions instituted by manufacturers will become less severe.

DEMAND UNIVERSAL LIGHTING.

At a recent meeting of the Sacramento Automobile Dealers' Association, Sacramento, Cal., a request was forwarded to the city commissioners and the county supervisors, asking for the enactment of a regulation requiring lights on all vehicles using the public streets and highways during the night season. This is in line with the activity manifested all over California, and it is probable that the matter will be taken to the legislature at its next sitting.

The Automobile Club of Southern California, in Los Angeles, already has taken the initial step in the latter move, and has requested the motorists throughout the state to aid it in bringing about a successful result to the campaign. The proposed law will call for one or more lights on all horse drawn vehicles, and if but one is to be carried, the placing of this on the left side, so as to determine the position of the vehicle at all times.

REGULATING PEDESTRIAN TRAFFIC.

While it has generally been admitted as a legal axiom that the pedestrian has the first right on the highways, and practically all attempts at regulating traffic have been made with this view in mind, there has been a growing feeling among motorists for some time that they were being called upon to assume a larger proportion of the responsibility along this line than was necessary in the proper safeguarding of the public. It is of interest in this connection to note that the cities of Europe are taking a new view of the matter.

According to the reports from abroad, London is taking steps to convince pedestrians that while they may have first right to the road, they do not have the sole right to it. Vienna appears to have taken a still more advanced step, the regulations compelling those on foot to keep to the sidewalk until they come to regular crossings. Violations exactly as in the case of vehicles which fail to observe the precautions assigned to them.

Mechanical Pointers for Garagemen and Repairmen

TIRE VALVE TROUBLES.

One of the simplest devices, and one with which all motorists have more or less unpleasant experience, is the tire valve. At Fig. 1 is shown a longitudinal section of a Schrader stem, which is used universally with its components clearly defined.

It consists of a tube-like section of brass, the outside upper end of which is threaded to take a cap, which is not shown. It will be noted that the inside is recessed to form a shoulder upon which rests the valve stem guide. Below this is an air passage leading directly into the inner tube. Another projection is fitted to form a seat for the rubber packing. Adjustment of the latter is obtained by utilizing the slotted end of the dust cap which fits the nib shown at the top in the drawing.

A threaded section screwing into the stem permits the raising or lowering of this part which is hollow, to allow the plunger rod to move freely. A cup shaped piece of metal, which is recessed to take the packing, fits into the threaded section and both of these move freely. This permits of the expansion of the rubber on its seat by screwing down the top member which rotates in the operation. These parts when in position, form a bearing for the plunger.

Midway in the centre of the latter is fastened a piece of metal which is slightly recessed, and to this is attached one end of a fine brass spring, at the other end of which is locked the guide. The latter is held on its seat by the compression of the spring through which the plunger slides.

Action of the Device.

In the sketch at the left is shown the components assembled in the stem and it will be noted that the valve is on its seat and the air vent closed. The spring is not fully compressed as the rubber packing is not screwed down to its normal position. Under such circumstances air would escape past the packing. In the drawing at the right is depicted the part in its proper place. The rubber has been expanded until it fills the recessed section. The plunger has been depressed, contracting the spring, and at the same time the valve has been forced away from its seat, and air is flowing up and outwards through the vent shown in the illustration.

The action of the device is automatic. When a tire is being inflated, the pump pressure being greater than that of the inner tube, the in-rushing air comes in contact with the valve, forcing that member downward, and passes on into the tube. When this energy ceases the compressed air in the tube forces the valve upward on its seat. This operation takes place on each stroke of the pump. As the volume of air increases in the inner tube more energy is required to open the valve and when that developed by the pump is not greater, difficulty is experienced in inflation.

How Air Escapes.

There are several causes for the escape of air, the most annoying of which is what is termed by motorists as a slow leak. It is almost imperceptible and the tire will not show its effect for several hours. It may be caused by the rubber packing being torn through careless adjustment, which frequently happens, or an imperfect seat of the member. Foreign elements may be present on the valve seat or the latter damaged.

Then again, the spring may stick preventing the valve from closing, but this seldom happens. Still another cause of trouble is cross threading the adjusting section as threads are small and destroyed easily. If a valve be suspected of leaking it can be tested by immersing the stem in water and escape of air will be noted by bubbles. Sometimes a leak may be cured by depressing the plunger several times which will tend to remove any dirt that may be on the seat.

It is a good plan to clean the valve stem and this may be done by removing the valve and inflating the tube, as the out-rushing air will have a tendency to remove foreign elements. Stems should be protected by utilizing the valve and dust cap which not only save the working parts but the inner tube as well. A valve tool should be included in the tire equipment. This instrument will recut both the inside and outside threads of the stem, smooth off the end and will facilitate the removal of stubborn valves. The device is inexpensive and will more than pay for itself in the event of trouble.

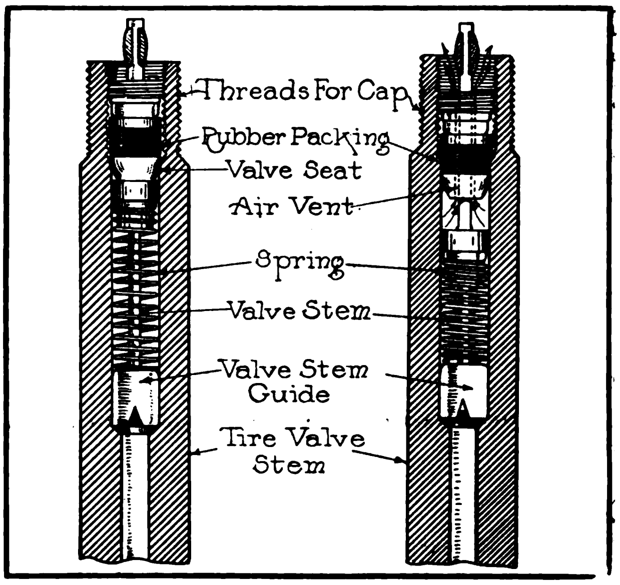


Fig. 1—Longitudinal Section of Valve Stems, Depicting Components.

CARE OF WIRES.

The average motorist does not give any attention to the wires of his car and these important members of the ignition system are frequently the cause of trouble. Some motors and transmissions leak oil and grease and the wires become coated with lubricant and dirt. Oil is fatal to the insulation and in time a puzzling skip may develop in the secondary system. Where wires are exposed to oils they should be cleaned with gasoline and wiped dry, especially the secondary. The rubber terminals attached to the magneto also should be kept clean, as any foreign substance at these points might occasion trouble.

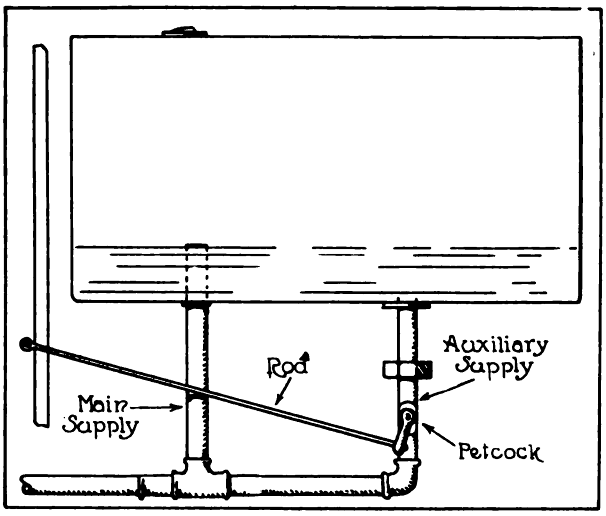


Fig. 2—Simple Method of Converting a Fuel Tank Into an Auxiliary Member.

BALL AND SOCKET JOINTS.

Ball and socket joints are utilized on many cars in the carburetion and ignition systems. These are seldom lubricated and as considerable wear takes place, there is more or less lost motion. Sometimes they become so worn that the ball drops out of the socket. When this happens on the road and an extra part is not available, the member may be repaired by removing it from the control rod and peining over the shell like part of the socket. This will enable the motorist to reach home, after which a new one should be fitted. Those on the commutator should receive attention from time to time as should any come apart, the timer is apt to advance and when cranking the car the operator is liable to be injured by a backfire.

AUXILIARY FUEL DEVICE.

Although the majority of the new cars are fitted with auxiliary fuel tanks, many machines are not so equipped. Such containers are built into the regular member and so arranged that the fluid is prevented from flowing into the main line by some form of shut-off valve. When the latter is opened the auxiliary gasoline runs through the regular channels to the carburetor.

The object of the reserve tank is to provide the motorist with fuel when the main supply has become exhausted. The operator who has not become stalled for lack of fuel is the exception rather than the rule, and often he is stranded some distance from a source of supply. Then again, many automobilists assume they have enough fuel and do not examine the tank.

At Fig. 2 is presented a simple method of converting the regular fuel container into an auxiliary member and the work is not difficult or costly. It can be performed by anyone familiar with the use of the soldering iron and possessing a slight knowledge of fitting brass piping connections.

It will be noted that the usual supply pipe leading from the tank is utilized for the auxiliary line and that a petcock is incorporated therein. To the lever of the petcock is attached a rod which leads to and through the seat partition, and which is fitted with a ring handle. In the sketch the petcock is depicted closed and when the auxiliary fuel is desired, the handle is pulled out, which opens the valve.

The regular supply of gasoline is obtained through a pipe which is cut into the main line and extended upward into the regular vessel. The height of the tubing will depend upon the capacity of the fuel container and the supply of auxiliary fuel desired. This may be determined by measuring the tank in the usual manner.

When the tank is filled with gasoline, the fuel will flow until the level of the standpipe is reached. The motor will then stop, denoting to the operator that the main supply has become exhausted. The rod leading to the petcock is then pulled forward, an operation that may be performed without the driver leaving the seat, and the reserve fuel is brought into service.

In fitting the standpipe to the tank care should be exercised in soldering because of the danger of the the gasoline vaporizing. Any plumber will fit the part needed and if one be not familiar with soldering, it would be best to have the work done by an expert. A shut-off valve may be incorporated in the pipe and located near the carburetor, which is decidedly more convenient than crawling underneath the machine to reach the usual member.

FRAME BRACING DEVICE.

Broken or sprung frames are not uncommon and many times these members being out of alignment are responsible for other mechanical troubles, among which may be named that of a leaking radiator, when the fracture is near the latter. There are several ways of repairing a frame, the methods varying according to the location of the break.

An instance of an effectual repair was noted by the writer recently. The frame was cracked near the goose necks and the workman fitted plates, riveting these members securely. As a severe strain was imposed upon the part, owing to the service performed by the car, a brace was employed as outlined at Fig. 3.

A .625-inch hole was drilled in each side member, these being directly opposite and on a line with each other. Two pieces of cold rolled steel, .625 inch in diameter, were threaded at each end, and a turnbuckle made as illustrated in the drawing. Each rod was fitted with two nuts, these being for the purpose of locking.

One of the rods was threaded into the turnbuckle and a nut screwed up after which it was inserted in the opening of the frame. The other rod was fitted with a nut and screwed into the turnbuckle. The nuts on either side of the frame were then locked and by means of the turnbuckle the tension adjusted.

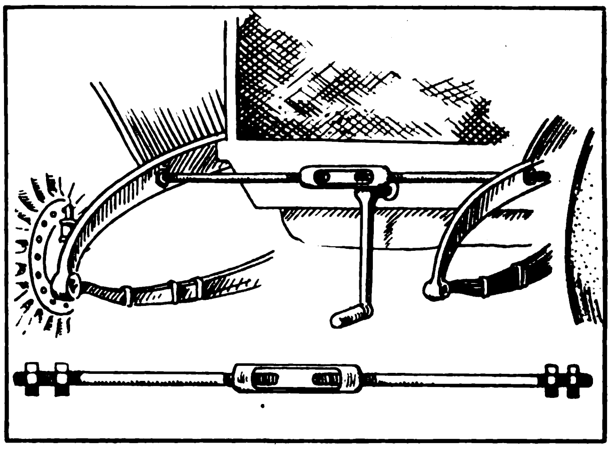


Fig. 3—Method of Bracing Securely Cracked Frame of Motor Car.

ADJUSTABLE SWINGING CRANE.

Many small shops are not equipped with any form of a hoisting device for lifting the motor or heavy parts from the chassis when overhauling the automobile. Under such conditions the general practise is to strip the engine, part by part, until but the crankshaft and flywheel remain for removal. In some garages but one repairman is retained during the quiet months of the winter and frequently he has to call for assistance in disassembling the car.

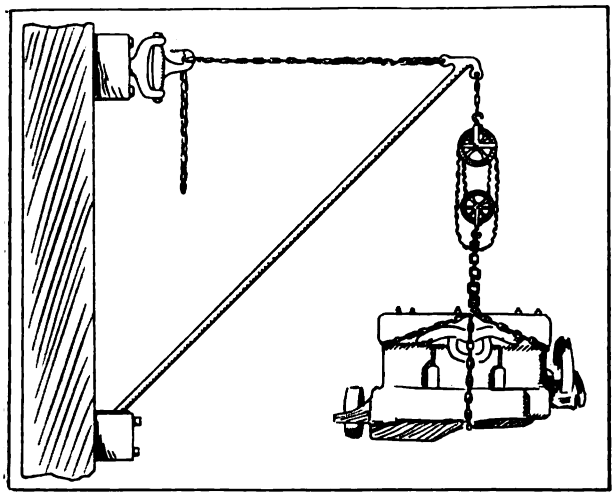


Fig. 4—Adjustable Swinging Hoist, the Material for Which Was Mostly Scrapped Parts.

A workman in one of these small shops made an adjustable swinging hoist which is depicted at Fig. 4, and the material used, with the exception of the chain eyes and pulley was taken from the scrap heap. The latter furnished a part of an old I beam section axle with the spindle bolt and bushing worn badly. The axle was cut to a suitable length, and a new bushing fitted to the spindle. It was then placed in a lathe and the arm turned down after which it was heated and bent in the form of a hook, as depicted at Fig. 5 A.

A wooden block was next procured, a hole cut to fit the axle and a strip of metal screwed on as shown at C to form a support to the axle. Four holes were next bored for the coach screws. Two more blocks were cut out and marked, holes corresponding to the others being bored. These were attached to the post by the screws as outlined at A in the sketch.

A small block was then made to fit between the upper and lower horizontal members and marked from the outside to provide an opening that would register with the vertical block. Metal strips were attached, as shown at B, these being for the purpose of providing a bearing for the axle and the retaining pin.

The axle was then passed through the opening in the vertical blocks and measured for the pin. After a hole had been drilled in the axle and the pin fitted, and the part replaced, the key was driven as shown in the sketch.

The lower support of the crane was made from a block of wood into which was set a ball socket E, the opening of which was enlarged slightly. The ball D was turned from a piece of stock, and enough shank left on the metal to fit into a piece of heavy tubing and a drive fit made. It was secured by drilling and riveting in two pins.

The piece with the eyes for attaching chain was made by a blacksmith and afterwards turned down and fitted to the pipe in the same manner as the ball member. The plates F were made to fit over the ball socket E after the latter had been placed in the block which was screwed to the post.

A suitable chain was utilized to connect the swinging spindle and crane, and the ball and socket bearing permitted this to be lengthened or shortened as desired. A two-sheave chain hoist of the Weston differential type was procured and attached as shown at Fig. 4. This enabled the operator to sustain the load in any position.

The device was attached to a post convenient to the work bench and its arrangement allowed it to be worked over 200 degrees. With it a motor could be lifted from the chassis and swung to any position within this radius, and lowered to the bench or to a stand. When not in use it was folded up and hooked against the post.

The device could be simplified by using a substantial hook in place of the spindle, while an eye bolt could be substituted for the block and the lower end of the crane made to fit.

CLAMPING WORK TO FACE PLATE.

With some work it is necessary to bolt or clamp a piece to the face plate, and many times it is difficult to keep the piece from slipping, especially it if become necessary to take a heavy chip in turning or boring. It is said that a piece of thin paper placed between the article and the face plate will hold it effectively.

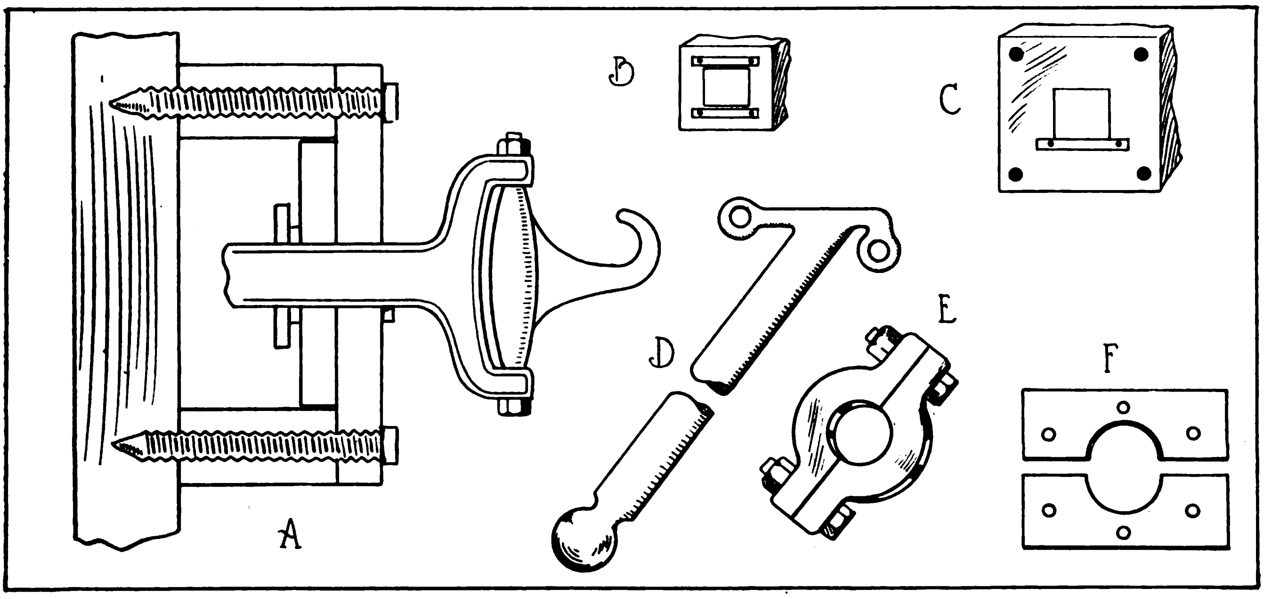


Fig. 5—Parts of the Hoisting Device: A, Depicting Method of Attaching Spindle to Post; B and C, Wooden Blocks Utilized to Secure Spindle; D, Upper and Lower Ends of Arm; E, Bearing for Ball End; F, Retaining Plates for Ball Member.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Wiring Splitdorf Coil.

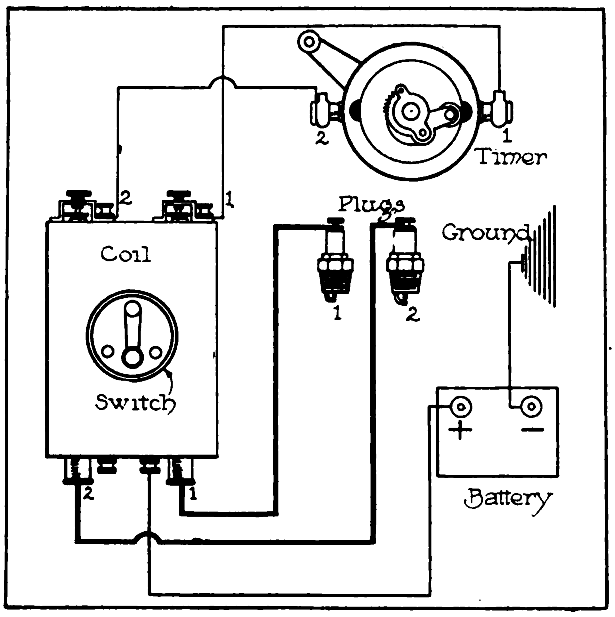
(117)—I have a burned out Splitdorf coil. I started to repair it some time ago and now find that I have lost the wiring diagram. There are two condensers in the unit and I don't know whether they are both connected in the primary circuit or not. The coil is fitted to a 1908 model A Maxwell machine and is a model 1905. Can you set me right in the matter?

CLARENCE H. PARKER.

Brockton, Mass., Oct. 12.

The coil referred to is of the vibrating type and in the accompanying illustration is presented the wiring plan. It will be noted that the battery is provided with two leads, these being marked positive + and negative —. The wire from the latter terminal is led to the frame and secured while the other wire is attached to the right hand terminal underneath the coil.

The leads from the timer or commutator are marked 1 and 2, representing the cylinders. The No. 1 is led to the right hand post or top of the coil and the No. 2 to the left hand terminal. The secondary wire, or cable, is next connected to terminal on the bottom of the coil and led to the plug of the No. 1 cylinder. The other lead will be the remaining cylinder.



Illustrating Wiring Plan of Two-Unit Splitdorf Coil of the Vibrating Type.

The diagram is followed easily but if desired the wiring may be tested. Take the spark plugs out of the valve caps and lay them upon the cylinders, taking care that their terminals do not come in contact with metal. Next, turn the No. 1 cylinder up on compression; that is, until the roller of the timer makes contact with the contact block marked No. 1 in the drawing. Upon throwing the switch to the "on" position the coil should buzz and a spark show at the plug of the first cylinder. The second cylinder may be tested in a similar manner.

Dynamo-Motor Wiring.

(118)—Will you please inform me whether a dynamo-motor could be arranged by having the positive and negative wires from a battery attached to the field of the dynamo-motor to start an automobile engine, and after it was started switch the positive and negative wires from the field of the dynamo-motor to the armature to charge a storage battery? It might be necessary to have two batteries. I will be greatly obliged for your opinion on the above question.

E. L.

Morristown, N. J., Oct. 15.

A direct current shunt wound motor will not turn over if either the field or armature is excited only. A direct current shunt wound dynamo will generate current only when the dynamo is capable of exciting its own field or this field is separately excited. In a motor the field and armature should be excited simultaneously by different sources or by one source of electricity. When the motor is driven by an engine conditions can be arranged for charging storage batteries and the motor then becomes a dynamo. Of course the desired results would depend upon the design of the electric combination.

Buying Second Hand Cars.

(119)—As a subscriber I would like to ask if you can give me some hints on how to judge a second hand automobile. I am thinking of purchasing a light touring car and would like all the information I can secure as to what parts should be examined and how to tell if the parts are in good condition. In short, what is the best plan to pursue in looking over a car in the few hours a buyer would have? Do second hand dealers have any way of fixing up a car so that it will appear all right long enough for them to demonstrate it and get the money?

H. O. WILLIAMS.

Concord, N. H., Oct. 11.

There are numerous parts which should be inspected for wear and condition, such as the power plant, clutch, transmission and rear system. The motor may be tested by turning it over slowly and noting if the compression is good and even on each cylinder. Its power will be noted in the demonstration during which the working of the clutch may be observed, especially if the prospective buyer drives the machine.

If possible the transmission should be inspected and the condition of the gears noted, as these may be badly worn. The rear system may be tested by jacking up the rear wheels and moving them to and fro to ascertain the amount of play. The steering gear should also be carefully tested, as this is a very important part of the mechanism of an automobile.

If not familiar with the mechanical details of motor cars it is advisable that some friend who is an expert look over the car. Regarding dealers fixing up machines, they generally repair and place a car in good running condition, and many concerns dealing in second hand vehicles maintain a repair shop for this work.

Charging Storage Batteries.

(120)—I have a six-volt, 60 ampere-hour storage battery and the charging rate given by the maker is three amperes. I have a 110-volt direct current in the garage and wish to employ it to charge the battery. Please inform me how to connect lamps to properly charge the cells.

C. BISK.

Hanover, Penn., Oct. 17.

Storage batteries can be charged with house or garage current provided it is direct. To reduce the rate to amount recommended by maker, lamps are employed and the number and candlepower depend upon the charging rate.

To determine the number required to bring about the necessary amperage is a simple matter, especially if carbon bulbs are employed. It is better to utilize this type as there is considerably more resistance than with the tungsten. Either 16 or 32 candlepower lamps may be used and six of the former will be required to reduce the rate to three amperes, or three 32 candlepower members.

A charging board is made easily, is not expensive and if considerable charging is to be done will more than repay for the labor. The material required is an eight-volt miniature switchboard voltmeter, an ordinary electric lamp wall socket, an electric door push bell button, a snap switch and six 16 candlepower carbon lamps or three 32 candlepower bulbs. These are mounted upon a hardwood board about 15 by six inches.

The positive wire + is led to the snap switch at the top of the board and the lead continued from the switch to the lamps, thence to the right hand side of the lamp socket. The negative wire — is connected to the other or left side of lamp socket. From these two terminals is connected the storage battery and care must be taken to note that the polarity is observed; that is, the negative wire from the battery must be connected to the negative lead from the lamp socket and the positive to the positive.

The voltmeter is placed in the centre of the board and the negative terminal connected by a wire to the negative lead from the main. The positive post of the voltmeter is led to the push button, thence to the positive wire leading from the lamps to the lamp socket.

Polarity must be observed and to determine which wire of the 110-volt current is the positive, immerse both leads in a glass of water to which has been added a little salt. By holding the wires apart, and turning on the current, bubbles will arise from one of the wires. This will be the negative and the connections are made to the charging board which should be marked + and — for future service.

Before charging, the cap or screw plug of each cell should be removed and if the plates are not covered with solution, distilled water should be added. This is accomplished by a syringe made especially for the work and it is not expensive. In charging the instructions of the maker should be followed carefully.

To test the battery with the current flowing from the main and through the lamps, press the button below the voltmeter. To test without the charging current flowing, turn the switch to "off" and press the button. Never press the button with the switch on and battery disconnected as the voltmeter will receive 110 volts, which will ruin it.

The function of the voltmeter is to enable the operator to note the action of the current. When the instrument is incorporated in the line it will be noticed that as the current is allowed to flow the voltage across the terminals of the battery will increase gradually, this being indicated by the instrument. When the rate is three amperes and the voltage reaches 2.5, reduce the current flowing to one ampere. The increasing or diminishing may be effected by adding or removing a lamp from the number specified in the circuit. Allow this one ampere to flow until each battery, if there are more than one, gives a voltage of 2.5 a cell, when it will be fully charged.

During the operation the plugs or screw members should be removed to allow the gas generated to escape freely and a naked flame should not be brought in proximity to the members. The charging rate should never exceed the maximum of the 10 amperes for the 60 ampere-hour battery. The maximum voltage on charge should be, for a three-cell, six-volt battery, about 7.5 volts. If no low reading voltmeter be at hand, charge freely at the high rate until the cells gas or bubble freely, and then cut down to the minimum rate until they again gas freely. When using lamp resistance not more than four batteries should be charged at the same time.

Excessive overcharging will bring about disintegration of the plates. If the cell be new the manufacturer should be consulted as to the proper purity and specific gravity of the electrolyte to be used and the duration of the initial charge. After the battery is charged the solution should be tested by placing some of it in a vessel made for that purpose. These are inexpensive and may be obtained at any supply house with the hydrometer, and an acid syringe also should be purchased.

The solution should register 29 degrees Baume, or 1.25 specific gravity; the division on the graduated scale of the tube at the level of the fluid will indicate the amount. Adding water lowers the hydrometer reading, while acid raises the specific gravity. When a new solution is mixed it should be allowed to cool before placing it in the cells. Chemically pure sulphuric acid should be employed and nothing but distilled water used. After charging is completed, remove all surplus solution with the syringe and wipe perfectly clean with tissue paper and replace the plugs.

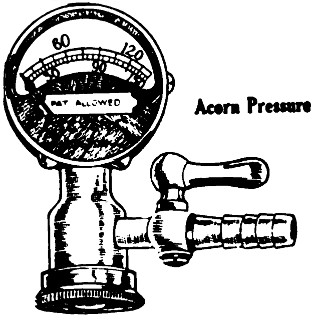
TREATING HARD CLUTCH LININGS.

When the leather lining of the clutch becomes hard and dry through neglect and slippage, and the limit of adjustment has been reached, the usual method is to reline the clutch, as oil will not penetrate the glazed surface. A driver who takes care of his own machine makes the following suggestion for treating leathers in above described condition: Take an old steel table knife and grind its end to an angle of 45 degrees and turn up outside edge about .0625 inch. The clutch is next thrown out and held, and the leather scraped with the upturned edge of the knife. This will remove the shiny surface, after which the material may be treated with oil. It is advisable to keep the clutch out over night, to allow the oil to soak in, and the surface should be cleaned before use.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Acorn Air Cock, produced by Stevens & Co., 375 Broadway, New York City, is designed for attachment to the end of the hose supplying pressure to a tire, and by utilizing the petcock attachment the supply may be regulated or shut off as desired. The gauge registers the pressure up to 150 pounds and is sturdily constructed of high grade material. The instrument is equipped with the patented Acorn device which eliminates screwing of a nipple to the valve stem.



Acorn Pressure Gauge

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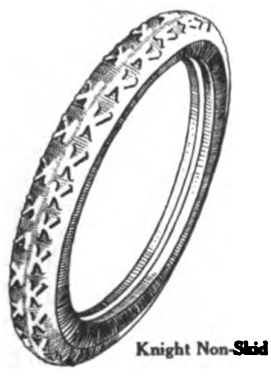
The Knight Non-Skid tire is manufactured by the Knight Tire & Rubber Company, Canton, O., and for it is claimed high grade material and workmanship. It is also stated that the thickness of the regular tread is such that the fabric is fully protected and that the anti-skid feature provides a shoe making for durability and long life. The traction is secured by two rows of elevations, these being in the shape of a letter K, and it is claimed by the maker that these with the depressions also prevent side slip. The casings are made in different types and sizes.


Knight Non-Skid Tire

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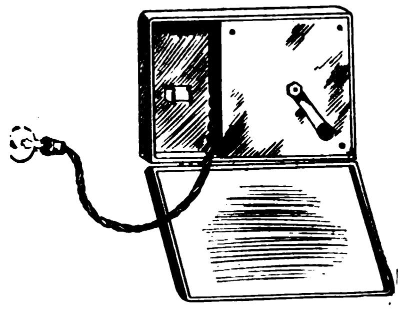
Woods' Extension Light varies from the usual inspection lamp in that the lamp itself is provided with a socket switch which is operated in the same manner as an ordinary electric lamp. The wires leading from the battery are always alive, an arrangement making for economy of time when the service of the light is desired. The entire apparatus is carried in a neat case, 4.5 by seven inches, and the device is installed easily on the car by three small screws. It is pointed out by the maker that the box may be concealed from view and fitted as convenient. It may be connected to the usual ignition batteries if desired. It is produced by the Flint Extension Light Company, Flint, Mich.


Woods' Extension Light

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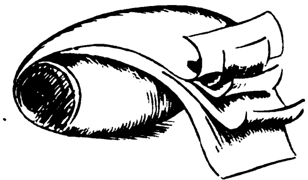
The O'Neil Tire Protector is marketed by the O'Neil Protector Sales Company, Cleveland, O., and is utilized to reinforce the casing irrespective of whether the member is old or new. It is composed of five distinct plies of fibre, thoroughly vulcanized and it is claimed by the maker that it protects the inner tube from punctures, as well as enables considerable service from an old casing. The protector is very flexible and is inserted easily, covering the entire inner surface of the shoe from bead to bead. It conforms to the shape of the tire, does not wrinkle or pinch the inner tube, and it is stated that it may be utilized indefinitely, as the protector is constructed of heavy material.


O'Neil Tire Protector

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The Lavigne Hose Coupling, manufactured by the Lavigne Hose Coupling Company, Detroit, will appeal to motorists who undertake their own repairs and who have experienced difficulty in making water tight the connections between the radiator and cylinders or other components of the cooling system. The design of the device is such that it may be applied by the hands, the maker pointing out that tools are not necessary. It is slipped over the hose, which is compressed by screwing up the coupling. The latter is made in different sizes, of steel or brass and is inexpensive. The maker points out that in assembling manifold or nipple the coupling should be .03125 inch smaller than inside diameter of hose.

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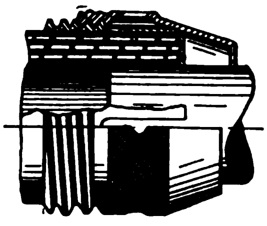
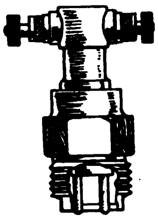
The Superior Double Spark Plug, marketed by the Superior Motor Specialty Company, 44 North Fourth street, Philadelphia, is provided with two electrodes and a like number of terminals, permitting the utiliza-

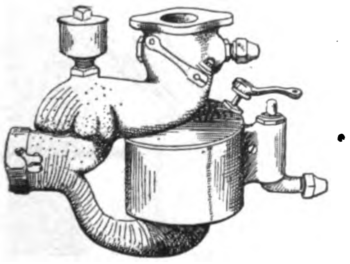

Lavigne Hose Coupling

tion of independent ignition circuits if desired. Two simultaneous sparks are obtained increasing the efficiency of the motor as well as making for economy in fuel. The plugs are made of high grade material and it is claimed by the maker that the points are self-cleaning. They may be employed in the same manner as a single plug if desired.


Superior Double Plug

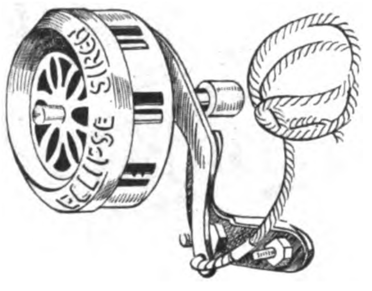
★

The Mayer Carburetor, manufactured by the Mayer Carburetor Company, 2673 Main street, Buffalo, N. Y., is compact in design and simple in construction, features which will appeal to the motorist caring for his own car. It is of the float feed, automatic type and the level of fuel at the spraying nozzle is held constant, insuring efficiency. The design is such that both the main and auxiliary air are obtained from the same source and the construction of the air inlet prevents the entrance of mud, water or foreign elements, as well as provides means for deflecting the stream of a backfire from the pan, eliminating danger of fire. A quality of the Mayer is the dashpot over the auxiliary air inlet, this being virtually an air chamber having a piston attached to the valve rod on which is seated the auxiliary air valve spring. It is pointed out that this arrangement makes it possible for the motor to respond quickly by virtue of the piston pushing against the air in the dashpot itself and creating correct resistance to the impulse of the auxiliary air valve to open suddenly. This regulation of the air valve makes, the company states, for flexibility, silence, economy and great power. The adjustment of the carburetor is a very simple matter, the dashpot and needle valve being the only parts requiring attention. The latter is provided with means for adjusting from the dash. The model H is water-jacketed and means are provided for fitting a connection for taking heated air from the exhaust if desired. One of the qualities claimed for it is that starting is made easy.


Mayer Carburetor

★

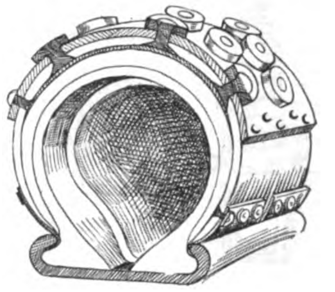
The Eclipse Siren Horn is a signalling device operated by friction and is designed for motorcycles and bicycles. A ball bearing wheel is forced in contact with the road wheel by a cord, and the momentum imparted causes the horn to give forth a penetrating sound. The device is nickel plated, is attached easily and is inexpensive. It is marketed by the Eclipse Specialty Company, 250 West 54th street, New York City.



Eclipse Siren Horn

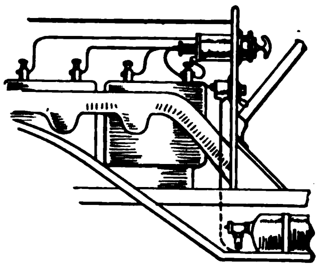
★

The Indianapolis Tire, made by the Indianapolis Tire Company, Indianapolis, Ind., is covered by a broad guarantee inasmuch as it is claimed it will wear 5,000 miles without puncturing, rim cutting or injuring the casing. There are three thicknesses of a special material through which it is stated that it is impossible to drive a nail. The tread is provided with a number of patented steel discs which prevent skidding and the members are made with taper holes so that they may be worn to the tread of the shoe without coming off. The tire is secured to the rim by means of steel hooks, a design which it is stated places the driving strain upon the wheels instead of the casing. It is claimed that the device is as resilient as a rubber casing and that it affords complete protection from water, sand or mud.

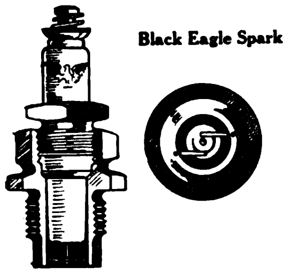

Indianapolis Tire

★

The Air-Gas Starter, produced and marketed by the Troy Auto Specialty Company, Troy, N. Y., is a self-starting device utilizing acetylene from a regulation tank, the gas being mixed with air and pumped to the cylinders by hand. The acetylene is led to a patent combination gas and air valve located on the dash, the device being equipped with a graduated dial and handle, by means of which the mixture may be controlled and the best results noted. To operate the starter, the valve lever is moved into its proper position and the handle of the pump drawn forward, after which it is depressed. The movement forces a mixture of acetylene and air to the cylinders through small tubing and the vapor is ignited by the usual spark. A feature of the system is the provision made for motors not equipped with priming cups. By the utilization of a


Troy Air-Gas Starter

specially constructed spark plug, the mixture is introduced through an aperture in the shell of the plug, and it is held by the maker that the car may be operated on acetylene alone by the proper adjustment of the gas and air valve. It is stated that the system may be installed easily, as it is free from complicated connections.

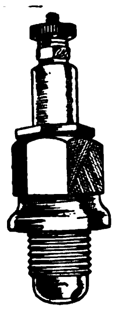

Black Eagle Spark Plug

* * *

The Black Eagle Spark Plug is manufactured by the Progressive Manufacturing Company, Torrington, Conn., and although moderate in price embodies all the desirable features of more expensive members. The best of material and workmanship are incorporated and a feature of the design making for high efficiency is that the base of the plug provides double electrodes so located that they present a round surface to the action of the spark, eliminating pitting. The design of the shell and shape of the insulator are such that the plug is absolutely gas tight, and it may be disassembled if desired without danger of breakage.

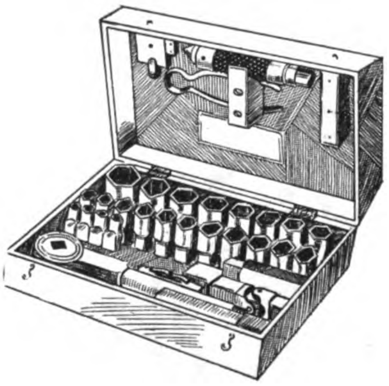
* * *

The Reflex Spark Plug, of the motorcycle type, is manufactured by the Reflex Ignition Company, Cleveland, O., and although designed for racing purposes is adapted for ordinary service as well. The electrodes are protected from oil or soot by a peculiar formation of the shell, which is globular in form and pierced by small holes. The insulation is a high grade mica although porcelain members are supplied upon special order. They are made in .5-inch standard, .87518 and metric threads, and each plug is covered by a liberal guarantee.


Reflex Spark Plug

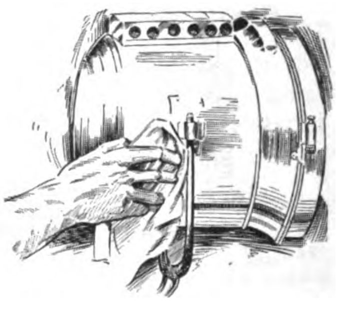
* * *

The Starrett Ratchet Wrench, is a patented tool manufactured by the L. S. Starrett Company, Athol, Mass., well known maker of machinists' instruments. The outfit comes in a neat box and comprises a ratchet wrench with a reversible pawl, and an extension; a spark plug socket, universal joint, screw driver, drilling attachment holding standard square shank drills, .125 to .5 inch; holder or friction wrench for drilling attachment, drift pin and thrust plate for drilling attachment. The outfit also includes 28 hexagonal steel sockets, varying in size by thirty-seconds from .3125 to 1.25 inches. The parts are constructed of the very best material and nicely finished and are designed especially for motor car service.


Starret Ratchet Wrench

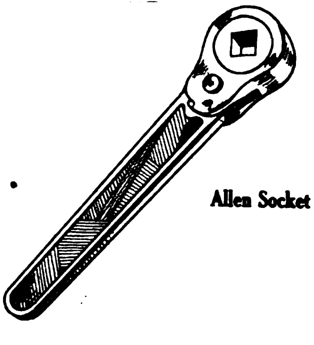
* * *

Silver Quick is a new preparation being marketed by the Atlas Auto Supply Company, 99 East Adams street, Chicago, and the utility of it will appeal to motorists who take care of their own machines. It is a liquid preparation which is applied to the brass and copper work of the lamps and other accessories of the car, and it is pointed out by the maker that one rub with it on a piece of cheesecloth will produce a genuine, lasting silver plate. By its application the tedious work of polishing brass is eliminated and the appearance of the automobile is considerably enhanced. The composition is claimed to be free from mercury or quicksilver and that it will endure for a long time. Each bottle contains enough to apply several coats of plating, which may be renewed from time to time.

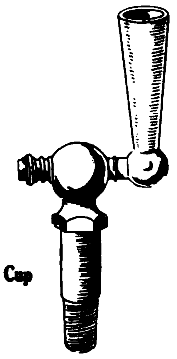

Silver Quick

* * *

The Allen Friction Wrench is a patented device manufactured by the Allen Wrench & Tool Company, 4 Meadow street, Providence, R. I. It differs from the ordinary type of socket wrenches in that it operates on the friction principle and is consequently free from teeth, springs, etc. The inventor points out that its grip is instantaneous and its design is such that it may be operated in smaller spaces than a ratchet member, as well as in much faster time. The wrench comes in a neat box containing sockets of different sizes, a short and long extension, screw driver, universal joint, etc. The sockets are of pressed steel, heat treated and case hardened, while the wrench proper is of drop forged high carbon steel, carefully machined and finished. It is made in three sizes.


Allen Socket Wrench

The Williams Priming Cup, marketed by the D. T. Williams Valve Manufacturing Company, Cincinnati, O., presents novel features, inasmuch as the operating lever or handle is funnel shaped and when placed in its proper position its opening registers with that of the cup, permitting the flow of gasoline to the cylinder. Another advantage is that when the handle is turned down or closed, the entrance of dirt is prevented. The cup is equipped with a spring key which automatically adjusts itself to any wear. It is made in three styles, adapted to any type of motor.


Williams Priming Cup

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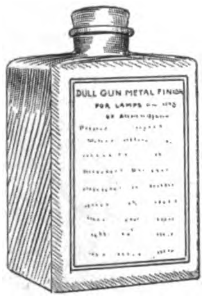
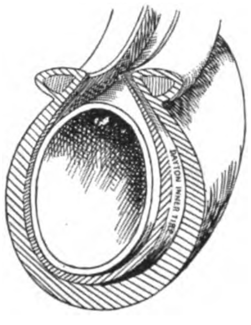
Gun Metal Finish is the product of the Gun Metal Finish Company, Decatur, Ill., and is a liquid which comes in a small can and is utilized for converting the brass or copper of the lamps, parts, etc., of the motor car into a dull finish. It is applied easily with a brush after the part has been thoroughly cleaned and it is claimed by the maker that the liquid will dry hard in 30 minutes. Usually one coat will cover, but in some instances a second may be necessary. If a gloss is desired it is obtained by treating the surface with linseed oil and rubbing with a soft cloth.



Gun Metal Finish

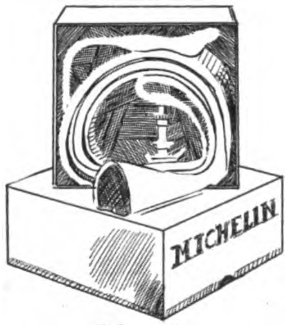
The Dayton Inner Tire is one of the products of the Dayton Inner Tire & Manufacturing Company, Dayton, O., and is utilized between the casing and the inner tube. It is constructed of a flexible but puncture resisting material and serves to strengthen the walls of the shoe, preventing blow-outs, etc. The edges of the liner are tapered, preventing pinching of the inner tube. As an example of the increased mileage obtained with the inner tire the company points out that one shoe gave over 14,000 miles service. The liner is made in two, three or four-ply, depending upon the size of the casing fitted, and special sizes are made to order.



Dayton Inner Tire

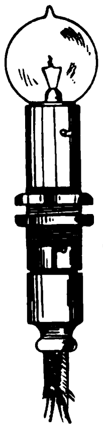
—— ★ ——

The Michelin Red Inner Tube for motorcycles is the product of the Michelin Tire Company, Milltown, N. J., and is of the butt end type, a design enabling the fitting of the member to the wheel without removing it or the tire from the frame. The tube is made of a high grade Para rubber and it is claimed it will retain its elasticity and will not crack, check or harden. It is made in four sizes for standard wheels.



Michelin Inner Tube

The Cello Adapter will appeal to motorists who desire to install an electric lighting system, as with the device the oil lamps may be converted into electrical units and without interfering with the service of the former. The device is installed easily by cutting a small hole in the lamp and is secured by two lock nuts. It is also provided with a bronze covered cable attached to a brass socket. The Cello adapter is manufactured by A. S. Campbell, Boston.


Cello Adapter

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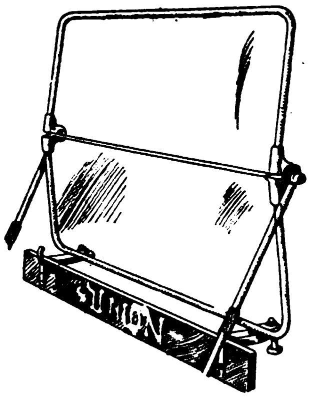
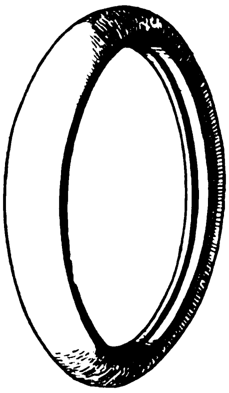
The Union Windshield, produced by the Union Auto Specialties Company, Brookville, Penn., is made in three models and is nicely finished. It is fitted with the Union patented automatic lock which provides three different positions as well as security. By means of the lock the shield is easily and quickly adjusted by one hand and it is claimed by the maker that after the desired positions have been obtained the lock automatically engages and is held rigidly. Absence of rattling is also claimed for the shield. Provision for ventilation is another feature included.



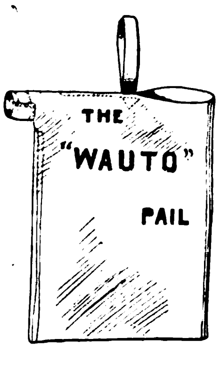
Union Windshield

The Bourn-Goodyear Tires, manufactured by the Bourn Rubber Company, Providence, R. I., are extra high grade, guaranteed shoes of the wrapped tread type. They are vulcanized by an improved single cure process which, combined with high grade material and workmanship, make for a durable and efficient casing. Each tire is carefully inspected and guaranteed. They are produced in standard sizes and types, also interchangeable members for motorists desiring to fit a larger casing to a regular sized rim.


Bourne-Goodyear Tire

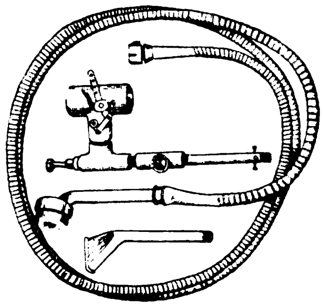
—— ★ ——

The Wauto Pail, manufactured by the Wauto Pail Company, New York American Building, New York City, is a practical and inexpensive device which will appeal to the tourist as it may be folded flat and placed under the cushion of the front seat of the motor car. It is constructed of a waterproof canvas, has a handle and spout of the same material and its capacity is two gallons. There are no hinges, rivets or pins utilized in its manufacture and it is claimed by the maker that it will withstand severe usage and last indefinitely.



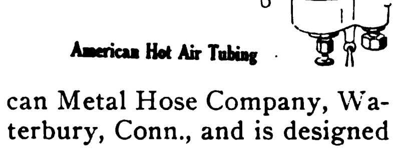
Wauto Pail

Auto-Vac is the product of the Auto Vacuum Cleaner Company, 253 23rd street, Milwaukee, Wis., and works on the same principle as the vacuum cleaner. It is operated by the exhaust of the automobile motor and comprises an attachment for the exhaust pipe, flexible metal tubing, suction brush and squeegee. By it the dust and dirt collecting in places inaccessible by the hand brush are removed easily and quickly, as well as from the clothing. It saves the trouble of brushing the clothes at the end of the day's run and as the connections are easily made it is a simple matter to operate the device. The hose is of sufficient length to reach all parts of the car.

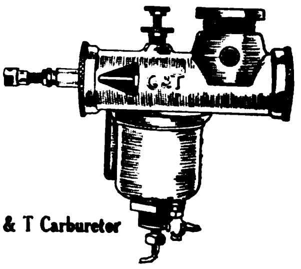

Auto-Vac

—— ★ ——

The American Hot Air Tubing is produced by the American Metal Hose Company, Waterbury, Conn., and is designed for conducting warm air from the exhaust pipe or manifold to the air intake of the carburetor. The tubing is flexible and made in inside diameters ranging from .75 to two inches. Its approximate bending radius is from 2.5 to five inches, a quality making for convenience in installation. The tubing is inexpensive and is furnished in exact lengths if desired.


American Hot Air Tubing

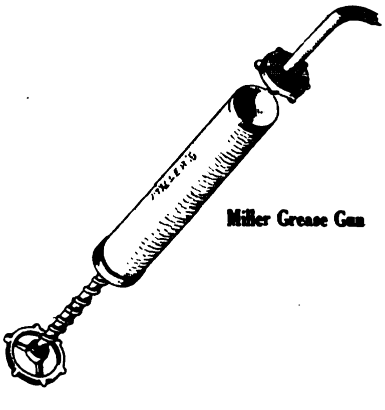
The G & T Carburetor is marketed by the Gallagher-Tompkins Company, 1876 Broadway, New York City, and a feature of the device is that it has but one wearing part. It is also claimed that the specific gravity of the fuel does not affect its proper operation. It has but one adjustment, springs are not employed and it is stated that the mixture is so controlled mechanically that the proper amount of air and gasoline is admitted at all speeds. A double nozzle is utilized, one set and the other mechanical, and the air is regulated by double intakes of a similar construction.



G & T Carburetor

—— ★ ——

The Miller Grease Gun, is manufactured by Miller & Starr, 250 Greene street, Brooklyn, N. Y. The plunger is actuated by a double spiral worm, and it is claimed by the maker that the device may be filled and emptied in 30 seconds, the operation involving eight turns of the wrist. The gun is fitted with a practical handle and it is stated that a stream of grease 30 inches long may be produced by one turn. The barrel is 17 gauge, made from heavy bronze and is said to be indestructible.


Miller Grease Gun

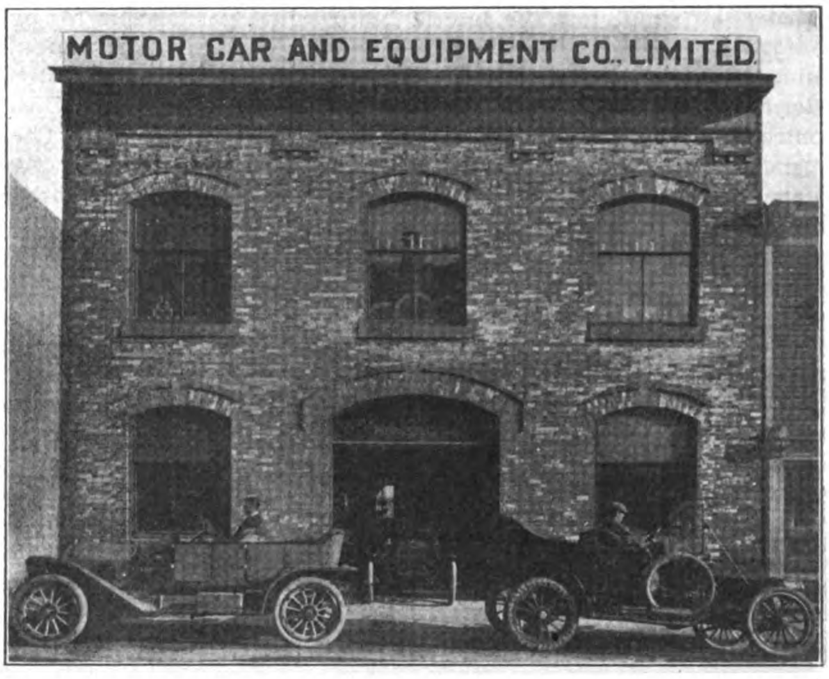
WITH THE INDUSTRY IN NEW BRUNSWICK.

Motoring Conditions Throughout the Province Indicate Increased Business in 1913—Special Reference to the Garage Situation in St. John.

WITHIN the past year the number of automobiles in use in New Brunswick, Canada, has increased over 100 per cent. The New Brunswick Automobile Association, which had been permitted to exist practically in name only, has elected a new set of officers, included among whom are some of the most influential men in the province, and its future programme is one modelled somewhat after the activities of similar bodies in the United States. At least one motor car factory is in process of erection, and the motoring situation, with reference to business for 1913 is decidedly promising from every aspect.

While Fredericton is the capital of the province, it is an inland city, and it may be assumed that St. John is the centre of the present organized effort to promote motoring in that section. St. John is within easy access of the provinces of Nova Scotia and Prince Edward Island, the former of which has but very few cars as yet and the latter none at all. While automobiles never were excluded from Nova Scotia, they have had little encouragement. Prince Edward Island gives every promise of removing the bann in the near future.

This situation explains in a measure the present activity looking toward the manufacture of cars, since St. John offers admirable shipping facilities to each of these neighboring provinces. It also accounts for renewed activity on the part of the St. John dealers, all of whom are making plans for increased business in 1913. The contract has been awarded for one splendid new garage and service station at Germain and Princess streets, in the heart of the city, and every effort will be made to attract and retain custom.



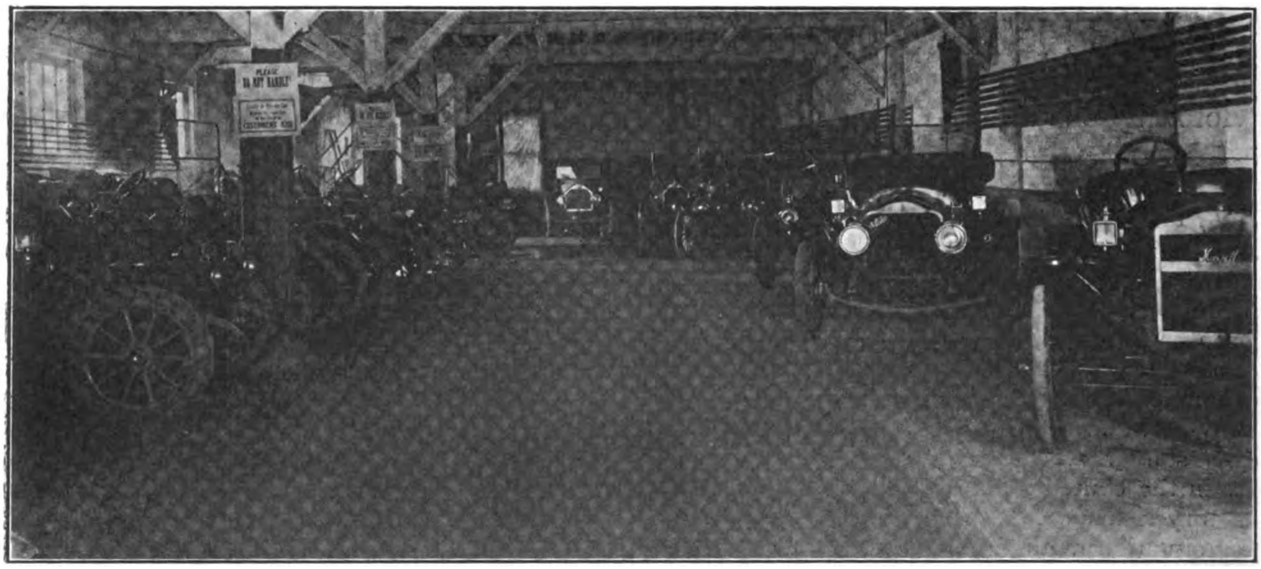
Exterior of the Princess Garage, Operated by the Motor Car & Equipment Company, Ltd., St. John, N. B.

The New Brunswick Automobile Association is to have its headquarters in this building, and it will be from this location that the campaign for good roads will be continued. The word is used advisedly, since some results already have been obtained. Tourists visiting eastern Maine have crossed over the border in years past with a view to visiting St. John and some of the other scenic points along the Bay of Fundy and beyond, but they have been impressed unfavorably by the lack of proper touring facilities. After reaching St. George, 32.7 miles from Calais, Me., and St. Stephen, N. B., a detour of some 25 miles has been necessary in order to avoid some five miles of desolate and impassable country over the old post road between St. George and Lepreaux.

After much persuasion upon the part of the New Brunswick Automobile Association, the townships between St. George and Lepreaux have united in the construction of a splendid gravel road over the old post road layout. This is practically completed and will be available for all tourists in the spring of 1913. As a result, it is anticipated that many more tourists will visit New Brunswick next year, particularly as Maine has been improving its roads through Washington county to Calais.

It should be remembered that as yet the New Brunswick parliament has practically no jurisdiction over the highways of the province. The association hopes to convince the legislators that it would be wise for the government to assume charge of the matter, in view of the fact that motoring tourists will leave large sums of money in the province each year, and it is not unlikely that this situation will enter into the selection of future members of parliament to a certain extent.

The new garage mentioned above is to be built for J. A. Pugsley & Co., one of the oldest automobile firms in St. John. Lockwood, Green & Co., Boston, Mass., is the architect, and when it is known that this concern drew the plans for the service station occupied by the J. W. Maguire Company, agent for Pierce-Arrow cars in Boston, it will be recognized that the structure is to be well adapted for the purposes to which it will be put. Its exterior largely will be of concrete and glass, particular attention being paid to the



Ground Floor of the Princess Garage,, St. John, N. B., Showing the Available Space for the Storage of Cars.

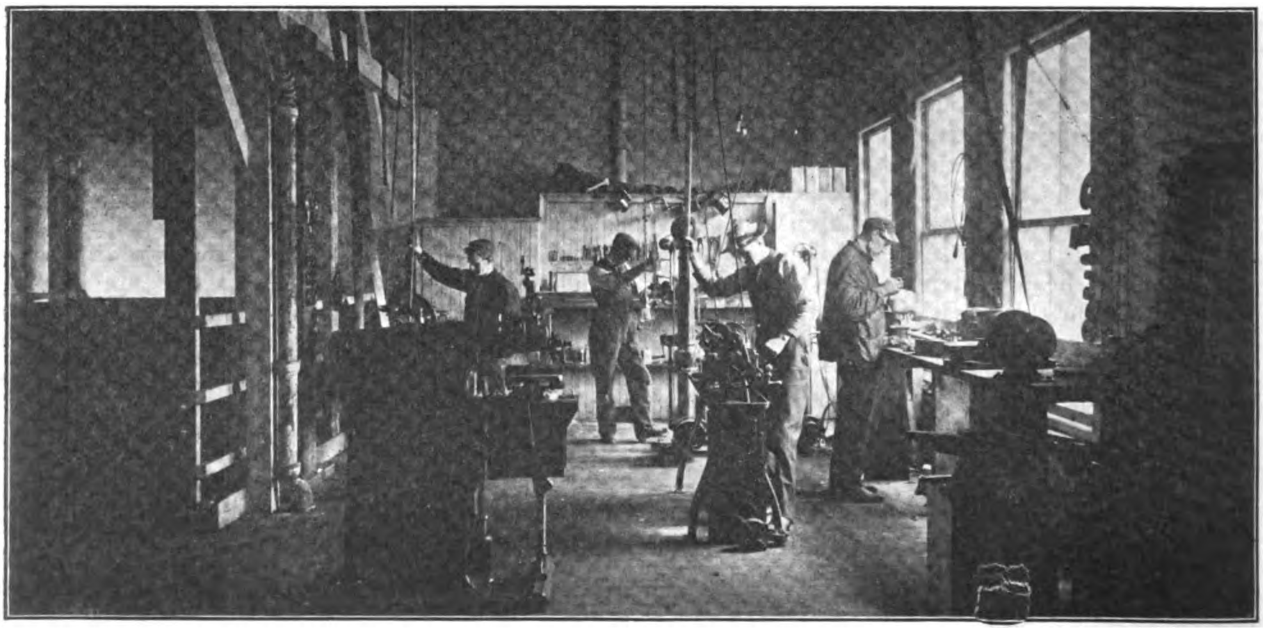
matter of supplying the interior with light.

J. A. Pugsley also is interested in the Maritime Motor Company, Ltd., which will occupy the factory now being erected. The location is on the line of the Intercolonial Railway and there are direct connections with the Grand Trunk and Canadian Pacific. Plans for the first Maritime cars are nearing completion, and it is anticipated that they will compare favorably with those produced in other Canadian factories. Many of the components will be purchased from American makers, this having reference to the motor, axles, etc.

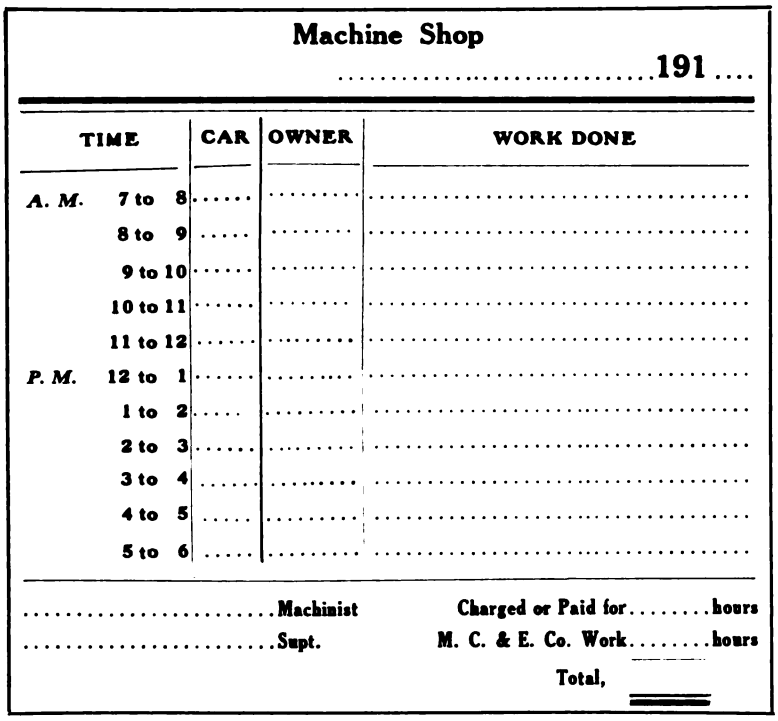
At present the principal garage in St. John, and in New Brunswick for that matter, is the Princess garage, operated by the Motor Car & Equipment Company, Ltd., at 110-112 Princess street, and of which F. W. Coombs is general manager. As may be noted from the accompanying illustrations, the building is of brick construction, two stories in height and the provision for lighting has been considered carefully.

A major portion of the ground floor is utilized for storage of transient and regular service cars, and as a salesroom for demonstration machines. The office is at the left as the garage is entered. An electric elevator conveys the machines to the repair shop on the second floor, which is located at the rear of the building. The front of this floor is devoted to the storage of spare parts, supplies and accessories. All of the appointments are as complete and up-to-date as any modern garage in the States. It is but natural that the Motor Car & Equipment Company should have built up a good paying business, both in cars and supplies.

Mr. Coombs is very proud of his business methods, and it may be added that he has considerable reason to be. Transient trade is on a strictly cash basis, and the system in operation is not unlike that utilized in most garages of today. At Fig. 3 is shown the tag, eight inches



Repair Shop of the Princess Garage on Second Floor, with Electric Elevator at the Left, Indicating Well Lighted Interior.



Machine Shop

..........................191....

TIME		CAR	OWNER	WORK DONE
A. M.	7 to 8	......	....	....
	8 to 9	.....	....	....
	9 to 10	......	....	....
	10 to 11	......	....	....
	11 to 12	......	....	....
P. M.	12 to 1	......	....	....
	1 to 2	.....	....	....
	2 to 3	......	....	....
	3 to 4	......	....	....
	4 to 5	.....	....	....
	5 to 6	.....	....	....

........................Machinist — Charged or Paid for........hours

........................Supt. — M. C. & E. Co. Work........hours

Total,

Fig. 1—Machine Shop Time Sheet Utilized by Princess Garage for Checking Up Workmen's Time.

long by 3.5 wide, printed on stiff board, which is filled out and attached to the car when it is left by the owner or chauffeur. The lower portion is detached and becomes the owner's check for his machine. If it should develop that repair work is needed, the method of procedure is the same in every way as that which applies to the regular patron, with the exception of the payment of cash when the machine is delivered, and will be described later.

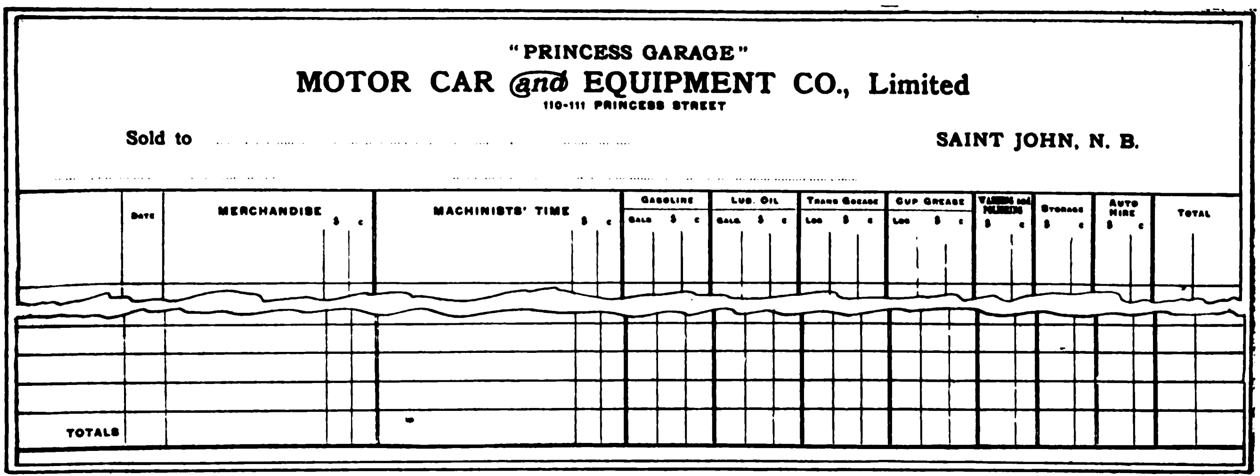
With the regular customer, cars are washed and polished at stated intervals, according to the terms of the agreement. In case supplies of any nature are furnished, the owner or chauffeur is presented with a duplicate slip bearing the number of gallons of gasoline, etc., and the price. These may be retained for checking up with the bill, which is rendered twice a month.

Fig. 2 presents the bill sheet, which is made out in duplicate, the original on white paper, forming a part of a loose leaf ledger and the duplicate on yellow paper being forwarded to the customer. This is 11 inches high by 8.5 wide, and it will be noted that there is daily space for recording merchandise purchased, machinist's time for work done, and all the other items which go to make up the bill. At the end of the period for which the bill is rendered these items are carried out for each day and the grand total appears at the foot of the sheet. The entire transaction is thus spread out before the owner and garage proprietor, alike, and in such manner that there can be no questioning the bill. The slips retained by the garage and the duplicates of them presented to the owner or chauffeur at the time of each transaction should agree, and if for any reason they do not, the error can be detected and corrected at once.

No repair work is undertaken except upon order, and when it is begun, if additional work is found, the whole job is held up until the owner is communicated with and his wishes made known. This applies to the transient as well as the regular patron, since there is a space on the transient tag for the owner's temporary address in St. John, so that he may be reached by telephone should such occasion require. This obviates the possibility of misunderstanding.

Each morning the workmen are supplied with machine shop time cards, as indicated at Fig. 1. These are the same in size as the bill sheet and make provision for the recording of the work done by each man every hour of the day. The workman is required to fill out his card at the completion of each job. Each item is checked up by the foreman, and at the end of the day the sheet is signed by the machinist and foreman, and becomes a permanent record of the day's work. It is possible that this portion of the system could be improved by the addition of a time clock, but with this opinion Mr. Coombs does not agree.

All supplies and spare parts are under lock and key at all times, and are not available to any but those who have direct supervision over them. Each workman furnishes his own tools. When-



"PRINCESS GARAGE"

MOTOR CAR and EQUIPMENT CO., Limited

110-111 PRINCESS STREET

Sold to .... SAINT JOHN, N. B.

	DATE	MERCHANDISE $ c	MACHINISTS' TIME $ c	GASOLINE Gals $ c	LUB. OIL Gals $ c	TRANS GREASE Lbs $ c	CUP GREASE Lbs $ c	WASHING and POLISHING $ c	STORAGE $ c	AUTO HIRE $ c	TOTAL
TOTALS											

Fig. 2—Interesting Bill Sheet Employed by Princess Garage, with Space for Recording Items Daily.

ever new parts are needed it is necessary for the machinist to make requisition upon the foreman, who procures the part or signs an order for it.

No...............

Name..

Address..

Date..................**License No**...............

		QUANTITY	AMOUNT
......	STORAGE...	....	....
......	Washing	....	....
......	Polishing	....	....
......	Gasoline	......Gals..	....
......	Cylinder Oil..	...... " ..	....
......	....	....	....
Machine Shop Repairs		Hours	
....		....	....
....		....	....
....		....	....
....		....	....
....		....	....

Order Rec'd by..

Wanted..

OWNER'S CHECK.

No.................

Car Left with..

IMPORTANT!

DELIVERY OF YOUR CAR WILL

NOT BE MADE

WITHOUT THIS CHECK

MOTOR CAR AND EQUIPMENT CO., Ltd.

Fig. 3—Princess Garage Transient Tag, Supplying Necessary Information for Workmen and Attendants.

The entire system is simple and sufficient in every way.

The character of repair work undertaken is somewhat more varied than that which is done by many garages in the States, since St. John is not within easy access of the factory which produces the car. It is possible to send to Boston, and await the arrival of parts by steamer or train, but in many cases it is found more desirable to undertake the necessary machine work at once in the company's own shop.

The company is agent for White cars, made by the White Company, Cleveland, O., and has been fortunate in creating a wide demand for this product. It also has taken upon itself to interest local merchants and business men in White trucks, or lorries, as they are termed in the British possessions, and three of these vehicles have been placed within a short time. These three trucks, with one other, a converted pleasure car, comprise the only commercial cars in St. John, and as far as is known, in the province.

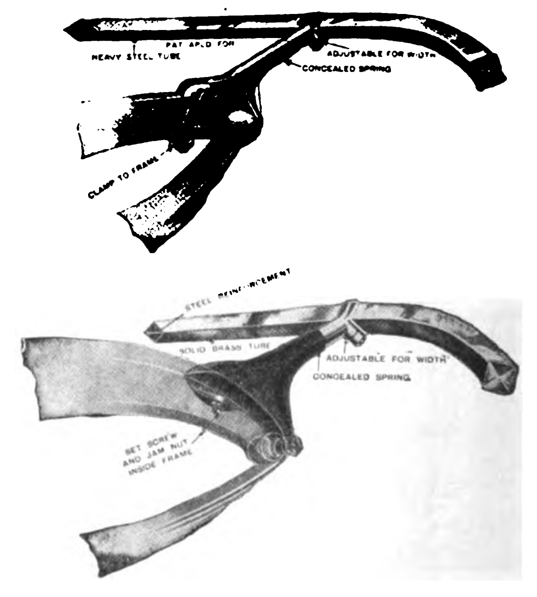
St. John has an abundance of steep hills and some road surface which cannot be regarded as ideal for mechanical transports. However, the city government is busily engaged in resurfacing many of the principal streets, and it is anticipated that there will be little difficulty in interesting business men in motor trucks, particularly as the White machines have given every evidence of their ability to cope with the situation in the short time they have been in service.

WILL USE SAGER BUMPERS.

Announcement is made by the J. H. Sager Company, Rochester, N. Y., that the Cadillac Motor Car Company and the Packard Motor Car Company, both of Detroit, have selected the Sager Diamond bumper as standard equipment for their 1913 models. The design to be employed by the Cadillac is shown in the upper portion of the accompanying illustration and a feature of it is that it is adjustable for width. The bumper proper is a heavy steel tube of diamond shape and finished in brass, black or nickel, making a decidedly attractive fitting.

The model to be fitted by the Packard company was especially designed and while it is of the clamped-on type, the clamps are invisible, a design that does not detract from the appearance of the car. The solid brass tube has a steel reinforcement and the retaining arms are adjustable for width. The finish is black and nickel, harmonizing with that of the machine.

Qualities emphasized of the Sager Diamond bumpers are their sturdiness and light weight, and the company is very much pleased with their indorsement by the makers of the Cadillac and Packard cars. The J. H. Sager Company also produces channel and round tube bumpers, and is marketing a special design for Ford cars.



The Sager Diamond Bumper Adopted as Standard Equipment for 1913 Cadillac and Packard Cars, the Smaller Model Being Used by the First Named Machine.

PRODUCTION AND PRICE OF GASOLINE.

BECAUSE of the rapid increase in the price of gasoline since the first of the year, those engaged in the sale and use of both pleasure and commercial automobiles have sought government aid in investigating the matter. The producers claim that there is ample reason for the increased cost, and their position is set forth, in a measure, by the following statement:

In order to understand fully the situation in this regard, it should be understood that a considerable proportion of the oil produced is not suitable for the manufacture of gasoline. The state which produces the largest number of barrels (California), with a total of 81,134,391 barrels, produces only a comparatively small amount of oil suitable for gasoline manufacture, the bulk of this oil being suitable only for fuel, road oil and asphalt production.

Dr. David T. Day of the United States geological survey, in his report on the production of petroleum for 1911, states that while fuel oils increased, refinery oils declined. It is from the refinery oils that the gasoline production is secured.

It should also be noted that gasoline can only be secured to the extent of the small percentage which is found in the oils, and where gasoline is not found in such percentage to pay for refining, the oil cannot be used for this purpose.

The figures given below show that while the general production of oil for 1911 increased over 1910, there is no increase perceptible in 1912 over 1911, and in all cases where increase has occurred the oil has been of such a character as to yield practically no gasoline.

In the meantime the consumption of gasoline has increased yearly between from 65 to 100 per cent. In other words, the oils from which gasoline can be drawn have not increased in quantity and it has been necessary to draw largely upon the accumulated stocks for the supply of gasoline. On account of the increased requirements for refinery oil, the price of crude oil suitable for refining purposes has risen approximately 33.3 per cent. during the last year. Not more than six months' supply of oil is in stock even in California, where much of the oil is not suitable for gasoline manufacture, and in many cases, the supply on hand is much less.

The total production of oil for 1911 (from the report of Dr. Day) was 220,449,391 barrels, and that delivered for all purposes during 1911 was 229,567,581 barrels. While the reports for 1912 are not yet available, the record so far given shows practically no increase over 1911:

December, 1910	93,038,828	bbls.
December, 1911	81,791,433	"
June 30, 1912	76,421,058	"

The production from the fields which supply most of the refining oil stands as follows:

1910	126,255,667	bbls.
1911	127,215,812	"
1912 (6 months)	62,900,069	"

In the meantime the best figures on the automobile business give the following number of cars in service:

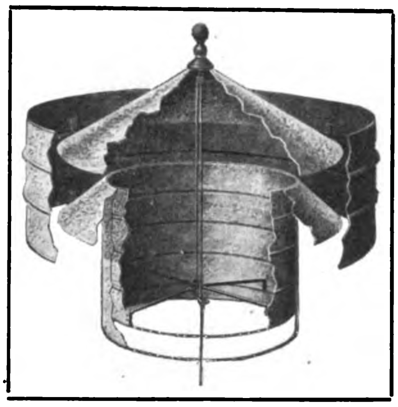
	Pleasure Cars	Commercial Vehicles
December, 1910	350,000	No record
December, 1911	550,000	No record
June, 1912	859,000	32,000

The estimated production of the automobile factories for 1912 is 300,000 cars. To this must be added the number of stationary engines, gasoline traction engines, motor boats and yachts, the production of which has increased several hundred per cent. in the last three or four years.

In other words, while the supply of oil has increased slightly, the supply of gasoline has not increased, but the demand is going up by leaps and bounds, and as a consequence the material is increasing in value.

VENTILATING THE GARAGE.

While the modern garage and repair shop are equipped with means for ventilation there are many old buildings which have been converted into automobile stations. With these it is a difficult matter to get rid of the smoke and fumes, and the usual method is to open the doors. In the winter time this means the loss of considerable heat. To overcome these difficulties the Burt Manufacturing Company, Akron, O., is marketing a ventilator, specially designed for garages and its construction is such that it may be fitted easily and at a slight expense. In the accompanying illustration is shown one of the several types made by the company and by it the smoke, etc., is carried out of the building. The device includes means for regulating the opening of the damper. Another design has a glass window, a quality which will appeal to garages not properly illuminated by daylight. A booklet upon ventilating the garage will be mailed free by the company upon application.



The Burt Ventilator.

SUCCESS WITH TIRE FILLER.

Meeting with a big demand for its product, The Resilient Auto Tire Filler Company of 41 Columbus avenue, Boston, which is producing a puncture proof tire filler claimed to eliminate 90 per cent. of tire difficulties, is offering a 30-day guarantee from the time of installation. During this time the full price of the tire filler will be refunded if the purchaser is not entirely satisfied with the service.

SIMPLICITY OF THE NEW J-M DEMOUNTABLE RIMS.

SIMPLICITY and ease of operation are among the qualities of the new demountable rim which has been brought out by the H. W. Johns-Manville Company, New York City. It is styled the J-M demountable rim, and as the accompanying illustrations show, comprises two main parts or band members, each of which carries one of the raised beads which hold the tire in place. As will be noted at Fig. 1 one rim is a continuous ring while the other is split diagonally and slips inside the solid member, where it is retained by dowels projecting from the under side of the main ring and engaging with depressions formed in the split ring.

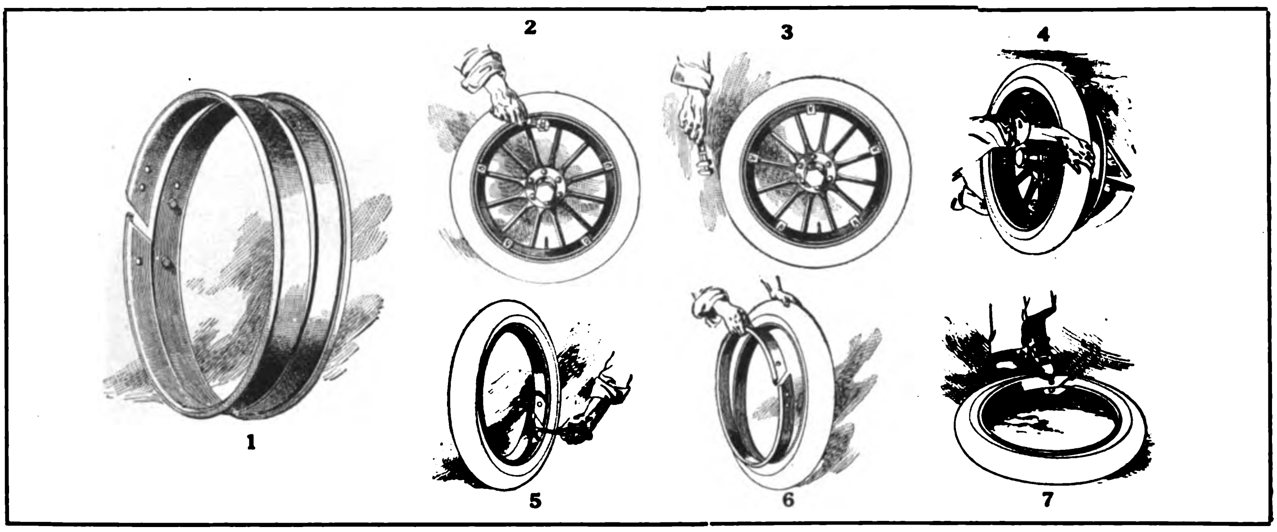
The construction is best explained by the operation of removing and replacing a rim, also the tire. After jacking up wheel, the top one of five simple but efficient clamps is loosened one full turn when the clamp will automatically drop down out of contact with the rim. The nut is then turned to retain the clamp, an operation performed easily with the fingers. The remaining clamps are similarly treated. The rim and tire are then removed as shown at Fig. 4. To remove the casing from the rim is a simple matter. A screw driver or J-M combination tool may be employed, and the end of either of these is inserted in the slot on the under surface of the demounted rim and pried out slightly, just enough to disengage the dowel pin and slip the two rim members apart as indicated at Figs. 5 and 6.

As the continuous ring has a perfectly smooth, flat surface, it is an easy matter to remove the shoe or the inner tube. After replacing the casing, which may be done easily, and without danger of pinching the inner tube, and before inflating the tube, the two rim members are assembled. This is accomplished by laying the main rim member with shoe flat upon the ground. After setting the tongue member into the groove of the other, the dowels are matched up with the dowel holes. The split rim is then pressed down with the foot as shown at Fig. 7, and the dowels and tongue snap into place when the rim is ready for mounting upon the wheel.

In replacing the rim and shoe the process is reversed. The lowest clamp nut is loosened enough to allow it to drop down over the rim and then tightened slightly. The wheel is rotated until the next clamp is at the bottom, when the operation of loosening and tightening is repeated, and so on until all five members have been secured. The nuts are then tightened with the offset wrench provided for that purpose, although an ordinary member may be utilized. The operation draws the rim into position and locks it securely.

As the two rings overlap for their entire width, water, dust or foreign elements cannot enter the shoe or inner tube and the tongue and groove form a block against the passage of dirt.

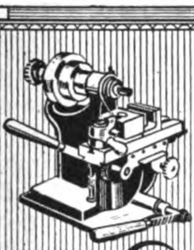
The J-M rim can be employed with any standard make of clincher tire, both quick detachable and regular. All parts are interchangeable and are Sherardized so that they are rust proof.



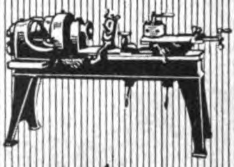
Illustrating the J-M Demountable Rim, Its Components and Method of Removing and Replacing Tires—The Design Is Noticeable for Simplicity and Few Parts.

MARION SHOWS ECONOMY.

The trip recently finished by F. J. Sleght of Indianapolis, Ind., in his Marion car, made by the Marion Motor Car Company, Indianapolis, bears special significance. For 2086 miles, through Indiana, Ohio, Pennsylvania and New York, Mr. Sleght, with three companions drove his car at an average cost of .5 cent a mile a passenger. Throughout the trip Mr. Sleght kept an accurate record of gasoline and oil consumption, charges for storage, washing and polishing, as well as incidentals and hotel expenses. The average cost of gasoline was 18 cents a gallon and that of oil 60 cents a gallon, the total cost of the former being $24.12 and the latter $7.20. For storage, washing and other incidentals there was expended an additional amount of $12.49.



Up-To-Date Shop & Garage Equipment



THE PERFECTION SPRING WINDER.

In fitting new accessories to the car and in the overhaul of the chassis, the work frequently requires a special sized spring or one of greater tension than may be secured readily from a supply house. The Remington Tool & Machine Company, Boston, is marketing a simple and inexpensive device known as the Perfection spring winder which is so constructed that it will wind accurately taper, double taper and right or left hand springs of any length, diameter or pitch from any gauge wire. It is constructed in three sizes having capacities ranging from the smallest wire up to .3125 inch.

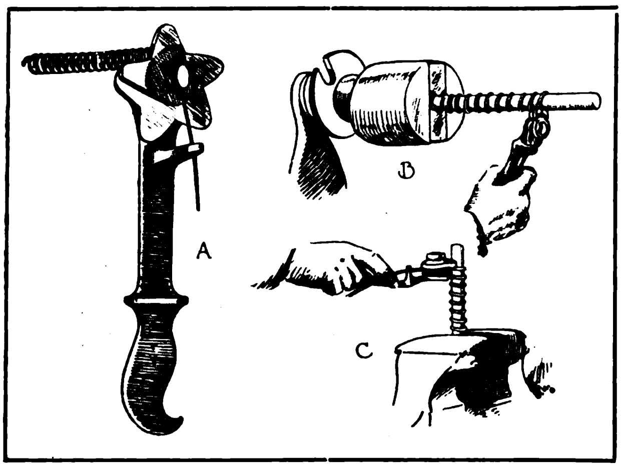


Fig. 1—Useful Tools for the Shop: A, the Perfection Spring Winder; B, Depicting Its Use in the Lathe; C, How Operated in the Vise.

The tool is illustrated at Fig. 1, the drawing at A showing how the wire is fed when the device is operated by hand, and that at C when in the vise with a mandrel. When utilized in the lathe or drill, an adjustable rotating disc provides for varying pitches as desired. The tool supports the arbor, making possible the winding of the very finest as well as the largest springs without kinking, as shown at B.

THE EDISON A. C. CURRENT RECTIFIER.

The growing tendency to light the automobile by electricity presents a new problem to the proprietor or manager of the garage and service station not equipped with means for charging storage batteries. In former years and before the magneto or mechanical generator of electricity replaced the battery as a source of current for ignition purposes, many shops installed charging panels and derived considerable profit thereby.

While the majority of lighting systems make provision for charging by means of the dynamo actuated by the energy of the motor, there are hundreds of cars on which the battery alone is utilized, the equipment being known as the straight storage battery system of lighting. The members employed must be removed from the machine and charged from time to time, the periods depending upon their capacities, lamp loads and hours of service.

In many garages the current is alternating and it is a well known fact that it must be converted into a direct when utilized for charging storage batteries. Many stations not equipped with rectifiers, send their customers' batteries to a charging station, and the practise not only means expense in time lost, but often the customer is inconvenienced as well.

These objections have been overcome by the invention and development of the Edison alternating current rectifier, produced by Thomas A. Edison, Inc., Orange, N. J., and shown at Figs. 2 and 3. The apparatus is stated by the maker to provide reliable and efficient means of charging batteries with an alternating current and the equipment does not require the services of an expert, it being operated easily by anyone familiar with the ordinary snap button type of switch.

The rectifier is practically a simple electromechanical valve in that it allows current waves of only one polarity to pass through it to the cells. The simplicity of operation is illustrated

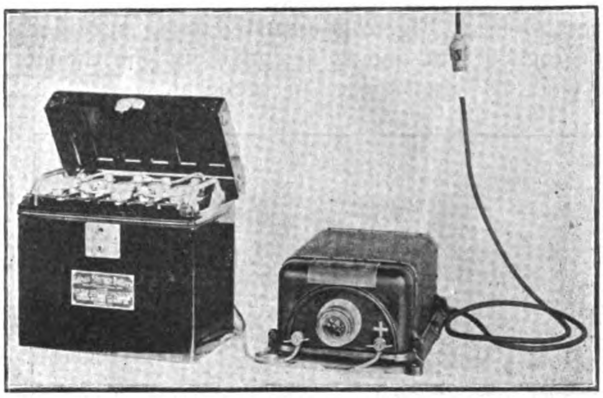


Fig. 2—The Edison Alternating Current Rectifier for Charging Storage Batteries.

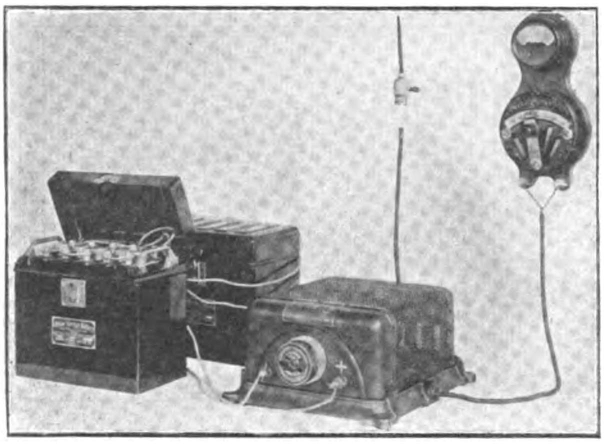


Fig. 3—The Edison Device with Rheostat and Ammeter for Service Where Different Charging Rates Are Required.

at Fig. 2, which shows the size B-2, eight amperes capacity, charging an Edison five-cell battery. The rectifier is provided with two wing nut terminals, the positive being indicated by a white +. This lead is connected to the positive of the cells and the other wire to the negative terminal. A connecting cord and plug provide means for supplying current from the main line.

The rectifier is equipped with a snap type of switch having "on" and "off" positions and by turning the lever to the former the proper charging current flows to the battery. It is pointed out by the maker that a battery may be charged in the same time with an Edison rectifier as with a direct current.

At Fig. 3 is shown the rectifier, size B-4, 16 amperes capacity, charging two sets of batteries. In order to insure correct adjustment of the charging current, a regulating rheostat and ammeter are employed as a unit. This equipment in conjunction with a cut-out switch and a fuse, inexpensive and easily installed, is recommended by the company when lead batteries of various types are to be charged and different rates of flow of current are required.

All rectifiers are provided with terminals for connecting rheostats in the charging circuit and are constructed for 110 or 220-volt circuits in various sizes to meet individual requirements. The type shown at Fig. 2 is adjusted for a specified charging current and is designed for the owner as well as the trade in general.

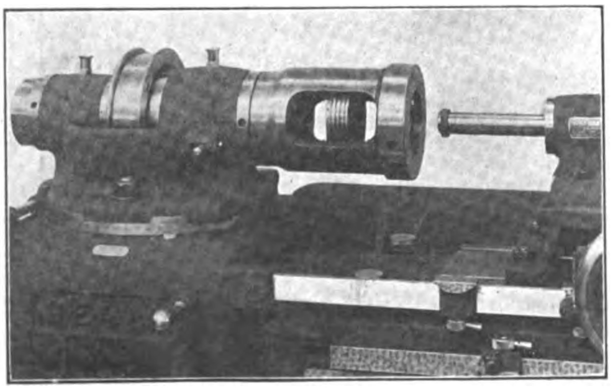


Fig. 4—The Heald Universal Bushing Chuck.

HEALD UNIVERSAL BUSHING CHUCK.

The improvements in the character of material utilized in the construction of motor cars, such as chrome nickel, and manganese steel, and other alloys, have made the use of a grinding machine a necessity in large shops. Carbonizing, heat treating and hardening produce more or less distortion, making the use of the grinder imperative to secure accurate diameters and true surfaces. The method is also valuable for finishing holes when one piece is to be held, for reaming without distortion is difficult when the walls of the work are thin and subject to collapse under the pressure of the chuck jaws.

Other materials, such as cast iron, phosphor bronze, etc., when used for work where accurately round and straight holes of definite diameter are required, such as wristpin holes, are handled easily by the grinding process and the possibility of distortion is eliminated when the walls of the piece are thin.

The Heald Machine Company, Worcester, Mass., is manufacturing the Universal bushing chuck shown at Fig. 4, designed especially for holding different bushings having thin walls. The bushing is clamped endwise while grinding the hole by a device comprising a barrel shaped holder mounted upon the work spindle of the grinder. On the front end is a removable cap threaded to the end to clamp the bushing, and this is removed to take out the work when finished. The collar at the rear of the bushing is threaded to fit the inside of the holder, and is adjustable for any length of bushing within the capacity of the holder. This rear collar is moved only when the work is changed. Both the collar and the clamp are fitted with interchangeable plates having holes slightly larger than that to be ground, and to handle bushings of different diameters substitute plates are employed.

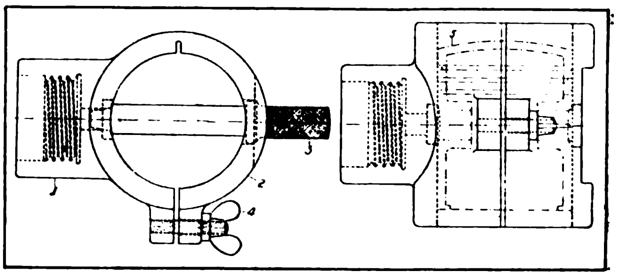


Fig. 5—Jigs for Holding Pistons When Grinding Wristpin Holes with Heald Machine.

At Fig. 5 is shown a jig for holding pistons for grinding the wristpin holes. The jig is threaded to the headstock spindle at 1, and the body 2 is bored to receive the piston 5, being held by the clamping screw 4. The piston can be located solely from the drilled hole by use of the plug 3, or if it is desirable to work from the head end of the piston for lengthwise location, a stop pin against the head end of the piston at the point 5 will insure the hole being at a definite distance from the head end, and the plug 3 can then be used simply to rotate the piston on its axis.

Recent Patents of Interest

Beck Priming Cup.

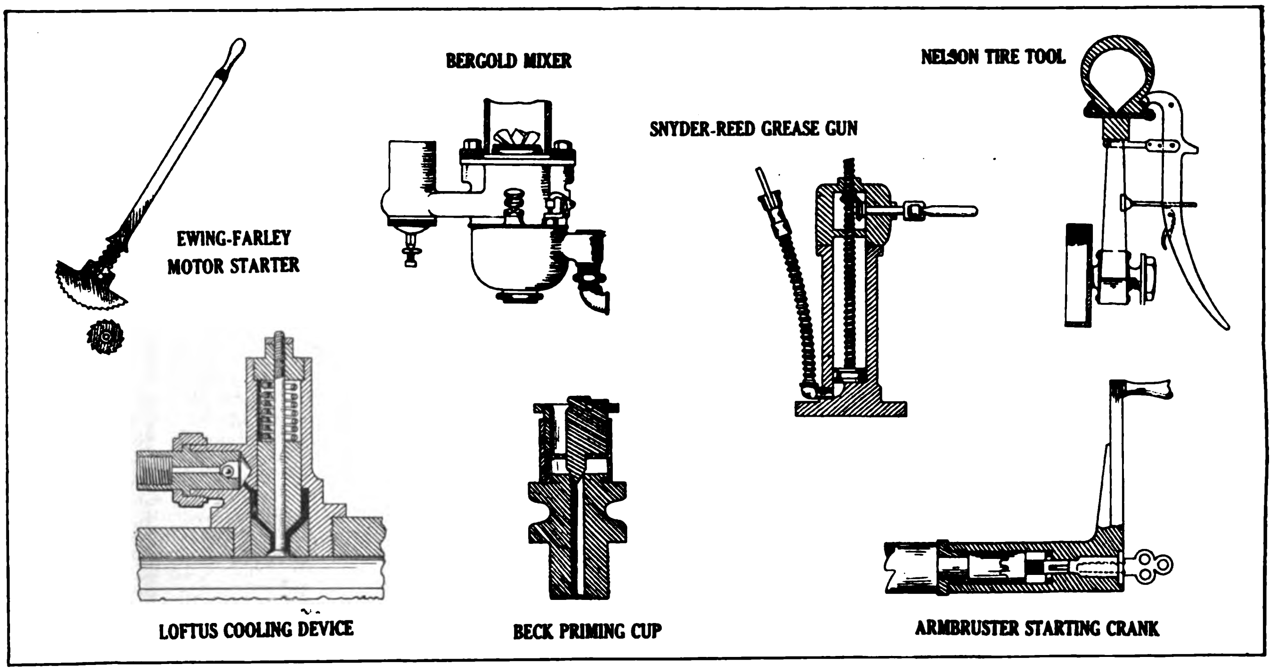
A patent has been granted to Charles W. Beck, Rockville Center, N. Y., for a gas engine priming cup in which the usual petcock and lever construction is eliminated. The cup comprises a base having a longitudinal priming aperture and an extension at its upper end. The cup proper is formed of a cylindrical shell having an inwardly turned annular flange at its lower end, the base extending into the cup and being enlarged at its upper end to interlock with the flange on the cup, thus securing it to the base. A closure plug is threaded into the cup, this being provided with a needle valve at its inner end so adapted as to close the outer end of the priming aperture in the base. The plug is so constructed as to permit of the passage of the priming fluid and carries a closure device adapted to close the outer end of the priming aperture.

Bergold Mixer.

Several devices for incorporation between the carburetor and intake manifold of the internal combustion motor, and designed to assist the vaporization of fuel, are noted among patents granted recently. Wilbur W. Bergold, Canton, O., assignor of one-half to J. M. Bergold of the same city, has secured letters patent for a mixing device which comprises a gauze interrupting disc provided with an offset rim portion and flanged rim members mounted above and below said offset rim portion of the disc. Upwardly and laterally inclined stationary deflecting blades are secured to the disc, which is provided with a plurality of openings. The mixture from the carburetor strikes the gauze and is broken up into a fine spray and deflected by the blade members.

Loftus Cooling Device.

Thomas J. Loftus, Castella, Cal., assignor of one-half to Harmon Bell, Oakland, Cal., has been granted a patent for a device to automatically inject water into the cylinder of a combustion engine. It comprises a supplementary cylinder fixed in the main cylinder and has two parts of dissimilar diameter, also a closure for the outer end. A valve member is located contiguous to the main cylinder, having a screw threaded and adjustable stem in the closure at its outer end. A spring actuated plunger is fitted in the part of the larger diameter, which is bored for the passage of the valve stem, which has its seat at the lower end of the part. The plunger seat is kept normally closed upon the valve member and is raised therefrom by the explosions in the main cylinder. The flow of the water is controlled by a valve



Illustrating Recent Inventions of Interest to the Manufacturer, Agent and Owner, Including Key Actuated Starting Crank, Tire Tool, Motor Starter, Grease Gun and Priming Cup.

member and passes into the cylinder when the port of the seat and that of the water inlet register.

Snyder-Reed Grease Gun.

Henry C. Snyder and Charles Reed, Minneola, Kan., have been granted a patent for a grease gun that presents interesting features in that it is provided with a flexible tube for conveying the lubricant to the part. The shell is made in two portions, one of which forms a removable head. The latter has an annular opening which fits an annular flange upon the shell member, making a joint. The plunger or piston is threaded and carries a small bevel gear loosely mounted upon it and is actuated by a similar member attached to a handle. Rotating the latter moves the plunger, forcing the grease out through the flexible tubing and nozzle.

Nelson Tire Tool.

A tire tool that is an improvement over devices of a similar nature is that patented by Axel A. Nelson, Washington, D. C. The lever is provided with an offset arm at one end for engaging the casing ring and the fulcrum bearing is secured through an extension having a curved end for the purpose of gripping the spoke of the wheel. A strut is incorporated between the fulcrum member and the handle and is provided with a ratchet and pawl mechanism, which secures the lever in the different positions into which it may be moved when in engagement with the tire.

Ewing-Farley Motor Starter.

George K. Ewing and Colby R. Farley, Ewington, O., have been granted a patent for a mechanical motor starter for automobiles. A horizontal shaft at right angles to the motor shaft carries a bevel gear which is meshed with a similar member upon the engine shaft. A ratchet toothed pinion is secured to the starter shaft and a ratchet toothed sector is so constructed and arranged as to mesh with the other pinion. The hand lever is longitudinally slotted and shouldered and carries the sector. An abutment is opposed to the shoulders of the lever and a horizontal pivot extends through the slot of the lever. A helical spring is compressed between the abutment and shoulders whereby the lever and sector are normally retracted.

Armbruster Starting Crank.

John C. Armbruster, Minneapolis, Minn., assignor of one-half to Ernst A. Armbruster of the same city, has patented a key actuating motor starting crank designed for the purpose of preventing others than those possessing a key from starting the engine. The device is simple in its operation, and when the key is removed, the interlocking teeth of the motor shaft and starting crank cannot be meshed. The lever of the starting crank is provided with a long sleeve like hub in which is mounted a pair of co-operating clutch members having interlocking teeth at their abutting faces. One clutch member is provided with a reduced stem portion, to the outer end of which is secured a hollow ratchet tooth head, the teeth being adapted to engage with similar members upon the shaft of the motor. The stem portion is journalled in a sleeve like bearing, the reduced end of which is screwed into the hollow end of a lever hub. In this manner this clutch member and head are held against endwise movements in respect to the lever hub, but are free to rotate in respect thereto. The clutch member is free for sliding movements within the lever hub, but is held for rotation by lugs on the other clutch member, that engage with slots formed in the interior of the hub. The rotary clutch operating bolt or stem is rotatively mounted in the outer portion of the lever hub, has threaded engagement with the first clutch member, and itself is held against endwise movements, so that by rotation thereof the two clutch members may be engaged and disengaged. The clutch operating bolt is constructed with threads of such pitch that one rotation will move the first clutch member from its normal inoperative position into operative, or vice versa. A small tumbler lock of the Yale type is employed, the barrel of its case being seated within and rigidly secured to the outer end of the lever hub, and its rotating tumbler is flexibly connected by a link to the outer end of the rotary bolt. When the clutch members are disengaged by the movement of the key mechanism, the starting crank is rendered inoperative in that the lever and its hub will rotate freely and will not mesh with the other clutch member.

OTHER PATENTS GONE TO ISSUE.

Muffler, George Cormack, Plano, Ill., assignor to Independent Harvester Company, same place. A muffler comprising a chamber having a series of baffle plates extending alternately from either side of the chamber, and outlet openings in the side walls between the position of the baffle plates.

Tire Tightener, Theodore F. Chrane, Gravette, Ark. The felloe of the wheel has an opening with reduced ends and spacing blocks with teeth having screw openings, and means are provided for moving said blocks.

Anti-Skid Device, Stephen S. Miller, Akron, O., assignor to the Consolidated Rubber Company, New York City. An anti-skidding device for dual block tires, comprising a chain extending over the tires and a plate and eye bolt for securing same.

Nut Lock, Otto Terrian, Manistique, Mich. A lock comprising a set screw adapted to pass through one side of the nut and engage with the bolt also a plate retaining device.

Battery Connector, James Monroe Hall, Sulphur Springs, Tex. A rotably mounted rod carries a number of fingers which contact with the poles of the cells and suitable wires and means for moving rod members into and out of engagement.

Motorcycle, Edwin O. Himes, Albion, Ind. A motorcycle carrying two persons, the main frame having side bars with upturned rear portions and a seat supporting frame attached thereto. The operator occupies the front seat directly in front of the rear passenger.

Motorcycle Stand, Samuel T. Steinberger, Peoria, Ill. Telescoping members are provided and incorporated with these are cylinders and pistons, the former containing a fluid, and a valve controlling mechanism.

Resilient Tire, Hugh A. Carmichael, West Lorne, Ontario, Canada. Coils of wire having an annulur form encircle the rim of a wheel and plates are secured to the coils.

Cushion Tire, Michael M. Weiss, Detroit. The tire is composed of solid material having inner and outer series of transverse passages of different diameters, the inner ones being arranged opposite the spaces between the outer ones.

Headlight Controller, Wilson B. Hargreaves, Bloomingdale, N. Y. The lamp bracket is secured to a spindle having a bearing head and to the spindle is attached a rod like member leading to and connecting with the steering mechanism of a motor car.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

S. Breakstone, Inc., Chicago; $50,000; to deal in motor vehicles and accessories; incorporators, R. Storch, W. H. Davenish, J. Warner.

Eldridge Manufacturing Company, Boston; $25,000; automobiles; incorporators, William E. Eldridge, Harold R. Church.

Rambler Motor Car Company, Inc., Haverhill, Mass.; $10,000; incorporators, George A. Burnham, James P. Molloy, Charles S. Goodwin, Frank B. Kimball.

McVey Manufacturing Company, Dayton, O.; $60,000; to manufacture automobile accessories, machines and mechanical appliances; incorporators, James L. McVey, Walter C. Fraine, Amos N. Burkhart, Millie Galloway, Richard J. McCarty.

Tri-Unit Electrical Company, Newark, N. J.; $100,000; general automobile business; incorporators, John B. Stobaeus, Jr., B. W. Matthews, William C. Stobaeus.

Continental Garage Company, Newark, N. J.; $10,000; general automobile business; incorporators, Littleton Kirkpatrick, Robert C. German, Stuart A. Young.

Ultra Motor Car Company, Boston; $100,000; incorporators, John C. Foster, Charles B. Moseley, William W. Blatt.

Hendricks Manufacturing Company, Camden, N. J.; $250,000; to deal in automobiles and accessories; incorporators, F. R. Hansell, John A. McPeak, F. S. German.

Elmhurst Motor Sales Company, Elmhurst, Ill.; $10,000; general motor car and garage business; incorporators, Walter B. Kidder, Hosmer H. Allyn, Frederick H. Bates.

United States Puncture Proof Tire Filler Company, Boston; $50,000; incorporators, Robert E. Magee, Austin Wilson.

Rockford Motor Truck Company, Rockford, Ill.; $10,000; to manufacture and sell electric and gasoline motors; incorporators, P. A. Peterson, Levin Faust, John Ledin.

Nyack Garage, Nyack, N. Y.; $15,000; incorporators, Alan Leggett, John J. Laine, Paul J. Dubois.

Neverskid Manufacturing Company, New York City; $50,000; to manufacture devices to prevent slipping of motor vehicles; incorporators, Charles H. Stanton, George L. Lewis, Daniel E. Wing.

Automobile & Garage Company, Yoakum, Tex.; $20,000; president, A. J. Ross; treasurer, J. Lyons; secretary, D. J. Shall.

McFadden Auto Company, Rock Hill, S. C.; $3500; incorporators, V. B. McFadden, D. B. McFadden.

T. F. Haarn Company, New York City; $10,000; transportation by means of vehicles, motor cars, vans, etc.; incorporators, Elizabeth Hahn, Jeannette A. Bravy, Charles A. LeFyre.

Kammer Automobile Company, New York City; $10,000; incorporators, William Magsamen, Frances Kammer, Max A. Kammer.

Perfection Automobile Body Company, New York City; $15,000; incorporators, James V. Simpson, William H. Mendel, Jr., William H. Mendel.

Hopkinsville Cadillac Company, Hopkinsville, Ky.; $10,000; to do general automobile and garage business in eight counties; incorporators, R. E. Cooper, T. W. Blakey, Odie Davis, Richard Levell, E. G. Peterson.

Grant Six Company, New York City; $15,000; to deal in motors, machinery, etc.; incorporators, Clarence P. Hulst, William G. Miller, James B. Speyers.

Blackburn Garage & Water Supply Company, Goldsboro, N. C.; $3000; to engage in the automobile business; incorporators, H. C. Smith, M. H. Allen, W. A. Blackburn.

Elyria Auto Sales Company, Elyria, O.; $10,000; to manufacture and deal in automobiles; incorporators, W. G. Bennett, I. W. Lyon, F. S. Bates, Correll H. Smith, J. J. Dillon.

Marion Garage & Auto Company, Marion, O; $15,000; incorporators, Burr Custer, Edgar S. Payntor, Gilbert P. Butterworth.

D. F. Poyer Company, Menominee, Mich.; $75,000; to manufacture commercial motor vehicles; incorporators, D. F. Poyer, H. T. Emerson, Fabian Trudell.

General Rim Company, White Plains, N. Y.; $150,000; to deal in motor vehicles and parts; incorporators, F. Oberkirsch, W. Kaul, Robert W. Ashley.

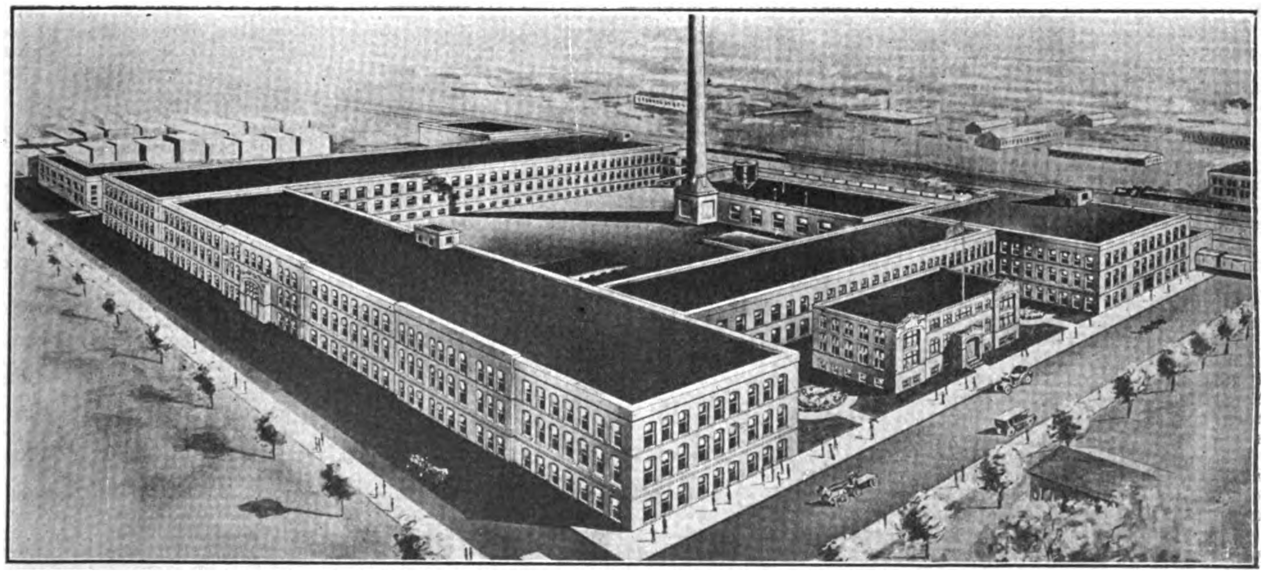
McDonough-Cogan Motor Car Company, Newark, N. J.; $25,000; general automobile business; incorporators, E. W. McDonough, F. T. Cogan, G. P. McDonough.

The Auto Salvage Corporation, Troy, N. Y.; $2000; incorporators, Michael Kennedy, Theodore P. Low, Mark F. Nichols.

Jefferson Garage, Inc., Charlottesville, Va.; $15,000; general automobile business; incorporators, R. L. Thomas, W. B. Jones, C. E. Blue, E. L. Thurston.

Macomber Motor Company, Los Angeles, Cal.; $5,000,000; incorporators, Walter G. Macomber, William B. Curtis, M. M. Kallman, J. M. Haenke, A. M. Scott, Charles Holloway, Jr., Edward G. Kuster.

Auto Supply Company, New Haven, Conn.; $20,000; to manufacture automobile engines, motors, etc.; incorporators, George D. Atwood, Charles D. Johnson, Raymond S. Bishop, John N. Champion, Everett T. Martin.



Plant of the Romadka Trunk Company, Milwaukee, Wis., Recently Purchased by Kissel Motor Car Company.

WITH THE MANUFACTURER

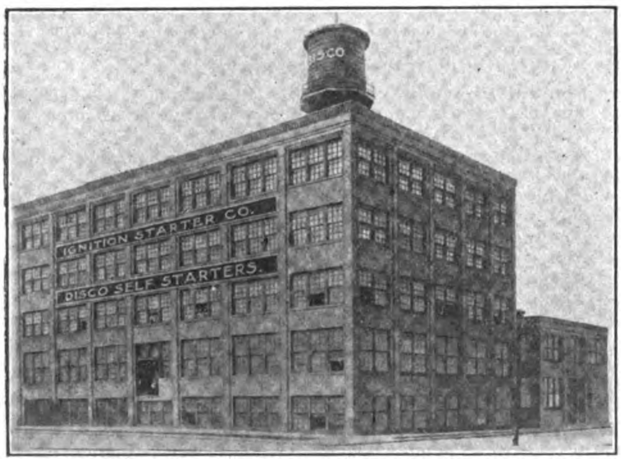
The Motz Tire & Rubber Company, Akron, O., maker of Motz cushion tires, has opened a direct factory branch at 4 Dundee street, Boston, Mass., in charge of M. A. Frank. This will succeed the New England agency formerly held by the Standard Tire & Rubber Company in that city.

Harry H. Elmer, formerly director and general manager of the Grant Motor Car Company and the Grant-Lees Machine Company, both of Cleveland, O., has resigned. Although he has been approached by several interests since this fact became known, it is understood that he will devote his attention to certain personal matters for the present.

The Century Electric Motor Car Company, Detroit, of which John Gillespie is the head, has moved its factory to the new building erected by the company at Woodward and Lathrop avenues and has started work with two shifts, night and day. The offices also will be moved to the new plant.

The Star Carburetor Company, 685 East Atwater street, Detroit, maker of Star carburetors, will be known in the future as the Star Foundry & Machine Company. The plant has been extended so that the making of carburetors is now a small part of the work done. Another new building will be added at once to take care of the rapidly increasing business.

The Apperson Bros. Automobile Company, Kokomo, Ind., held a meeting of its stockholders at the company's office recently, when Elmer Apperson, Edgar Apperson and T. E. Jarrard were elected as directors for the coming year. Later, at a meeting of the board of directors, officers were elected as follows: President and general manager, Elmer Apperson; vice president, T. E. Jarrard; secretary and treasurer, Edgar Apperson.



New Factory of the Ignition Starter Company, Detroit.

The K-R-I-T Motor Car Company, Detroit, maker of K-R-I-T cars, will provide for a salesroom in the new one-story service station now in course of erection at the factory.

The Ignition Starter Company, Detroit, has moved into the new factory building shown in an accompanying illustration. This concern manufactures the Disco starting system, now in use on some 30 different makes of cars, and one of the features of its business has been the fact that no matter how rushed it has been it always has been able to make prompt delivery. This same service is still further guaranteed by the completion of the new building.

A. T. Carbahan, veteran tire salesman of the Swinehart Tire & Rubber Company, Akron, O., has been appointed district manager in charge of Ohio, West Virginia, Kentucky, western New York, western Pennsylvania and eastern Michigan.

The Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, has opened a factory branch at Birmingham, Ala. The salesroom and service station is located at 619-621 South 20th street, where trained factory men are ready at all times to give factory technical service. L. L. Barnes is manager of the plant.

L. A. Austin, until recently sales and advertising manager of the Rutenber Motor Company, Marion, Ind., has resigned to become general sales manager of the Mais Motor Truck Company, Indianapolis, Ind.

The Sturdy Manufacturing Company, Chicago, maker of Sturdy spark plugs, has taken over the Sta-Rite line of ignition plugs, consisting of the Venus, Vulcan and Gotham. The Sta-Rite Vulcan plug is of the double porcelain type, the Venus, a mica plug and the Gotham a single hollow porcelain spark plug. The Sturdy company will also build special brand spark plugs on a large scale for the 1913 season.

The Henderson Motor Car Company, Indianapolis, Ind., maker of Henderson cars, has closed contracts for the following agencies during 1913: Henry L. Hattemer, Montgomery, Ala.; Herbert Nuttall, Pacific Grove, Cal.; S. F. Ruff, Stockton, Cal.; J. Ramselius, San Jose, Cal.; Wesley B. Parker, Ventura, Cal.; Williams Bros., Lordsburg, Cal.; P. J. Weisel & Co., Anaheim, Cal.; Dr. Charles L. Wetzel, Miami, Fla.; Wynn W. Scott, Haines City, Fla.; R. C. Neely & Co., Waynesboro, Ga.; D. D. Snyder & Co., Danville, Ill.; Frank J. Adams, Salisbury, Md.; W. S. Farrant, Grand Rapids, Mich.; The Bergen Auto Company, Fargo, N. D.; Monroe City Auto Company, Monroe City, Mo.; H. J. Morse, Saranac Lake, N. Y.; Falls Auto & Sales Company, Cuyahoga Falls, O.; C. D. Hershberger, Wilkesbarre, Penn.; Automobile & Supply Company, Lancaster, Penn.; George T. Bergeron, Calvert, Tex.

The R-C-H Corporation, Detroit, maker of R-C-H cars, has closed 1913 contracts with the following dealers, who will handle the cars in their respective territories: C. H. Dean, San Antonio, Tex.; Harry Washburn, Bath, Me.; J. J. Youd, Mt. Bullion, Cal.; E. M. Dates, Santa Rosa and Sausalite, Cal.; George C. Hupp, Birmingham, Mich.; George W. Garland, Holyoke, Col.; Crescent Garage & Supply Company, Crescent City, Ill.; Muncie Garage, Muncie, Ind.; Burkhalter Bros., Mulberry, Ind.; Greider & Hawkins, Flora, Ind.; H. L. Gilbert, Chillicothe, Mo.; Howard C. Parker, Center, Tex.; C. M. Story, Wabash, Ind.; Kathryn P. Carroll, Hartford City, Ind.; Becker Automobile Company, Portland, Ore.; G. E. Kelly, Kossuth, Penn.; Dr. P. M. Raysor, Bryan, Tex.; Rudolph Dittmar, Massbach, Ill.; Perry & Westin, Newberry, Mich.; Berry Garage, Chicago; W. W. Calhoun, Fort Gaines, Ga.; K. W. R. Detwiller, Palmerton, Penn.; Max Wolcott Garage, Corning, N. Y.; A. S. Baker & Son, Stratton, Col.; Newton Root, Kalamazoo, Mich.; Grant S. Emery, Jonesville, Mich.; V. H. Hancuff & E. S. Shelly, Williamsburg, Penn.; P. E. Weimer, Rockwood, Penn.; Corn Belt Auto Company, Waterloo, Ia.

The Kissel Motor Car Company, which is soon to establish a branch factory at Milwaukee, Wis., recently invited the members of the Milwaukee Merchants & Manufacturers Association to make a pilgrimage to its plant at Hartford, Wis. The accompanying illustration shows the party about to leave the station in Hartford in 24 KisselKar pleasure cars.

The Imperial Automobile Company, Jackson, Mich., maker of Imperial cars, has established a factory branch at San Francisco. G. A. Troutt, direct from the Imperial factory, has taken over the Imperial interests for the entire Pacific Coast and a large service station has been established at San Francisco for Imperial owners.

The Marathon Tire & Rubber Company, Cuyahoga Falls, O., will soon enter the market with pneumatic tires and reliners. Will Ridge, vice president and general manager, was formerly with the Firestone Tire & Rubber Company, Akron, O., maker of Firestone tires. Walter Jenks, secretary and treasurer, is an engineer of repute who has much knowledge of the tire business. Franklin Kesser, sales manager, enters his duties after long training, lately with the Firestone organization. The company expects to have its new factory in operation in a short time.

The M. & M. Company, 500 Prospect avenue, Cleveland, O., has placed on the market a new product, the Lubro non-freeze fluid for radiators. It is claimed to withstand a temperature of 10 degrees below zero without freezing. It does not expand when frozen, so that even if it should freeze in exceptionally cold weather there would be no harmful results. The M. & M. lubricants have enjoyed a reputation in the market that will give an impetus to the new article.

The Cole Motor Car Company, Indianapolis, Ind., maker of Cole cars, has appointed the following agents for the coming year: L. Kampf, Armington, Ill.; C. C. Hinckley, Aurora, Ill.; C. W. Walters, Bloomington, Ill.; F. W. Davis & Sons, Fall River, Mass.; Ft. Wayne Iron Store Company, Fort Wayne, Ind.; Model Machine Works, Frankfort, Ind.; H. A. Knease & Sons, Iowa City, Ia.; Fleming & Brown, Kankakee, Ill.; Kewanee Garage, Kewanee, Ill.; Eisen & Phillips, La Crosse, Wis.; Hotel Brown Garage Company, Middletown, N. Y.; W. J. Riley, Momenee, Ill.; J. L. Wiese & Son, Champaign, Ill.; John Henwall Auto Company, Chicago; J. B. Chambers & Son, Danville, Ill.; Cole-Montgomery Motor Company, Montgomery, Ala.; Royal Automobile Company, Montreal, Can.; L. M. Magee, Needham, Ind.; B. E. Brading & J. M. Swick, Olney, Ill; C. W. Robison & Co., Peoria, Ill.; A. R. Slinger, Portage, Wis.; Dale Dietrich Ravenna, O.; Welby C. Waterfield, Sandusky, O.; Cole Motor Company, Sioux City, Ia.; Van Duyn & Mathias, Springfield, Ill.; Frank L. Winters, Decatur, Ill.; G. H. Dean & Co., De Kalb, Ill.

The Rutenber Motor Company of Marion and Logansport, Ind., has acquired a plant at Chatham, Ont., where Rutenber engines will be manufactured for the Canadian trade. G. W. Bowen, the new president of the Rutenber company, will be at the head of the concern.

The Knight Tire & Rubber Company, Canton, O., has increased its capital from $500,000 to $1,500,000 in order to make large extensions and improvements to its plant.

H. D. W. Mackaye, assistant to the president and director of affairs of the Keeton Motor Car Company, Detroit, maker of Keeton cars, and also of the Keeton Motors, Limited, Brantford, Can., has announced that eastern interests with which he is connected contemplate the establishment of one of the largest body building plants in the world for the manufacture of automobile bodies of both wood and steel. Joseph W. Mackaye will be president of the concern and H. D. W. Mackaye will be treasurer and general manager. The capitalization of the company is understood to be $200,000.

C. W. Jacoby, who has been long connected with the automobile industry, has resigned as eastern sales manager of the Standard Electric Car Company, Jackson, Mich., maker of Standard electrics, to become general sales manager of the Pullman Motor Car Company, York, Penn., maker of Pullman machines.

William J. Slater, assistant sales manager of the Michigan Motor Car Company, Kalamazoo, Mich., maker of Michigan machines, has been elected a member of the executive committee of the central division of the Associated Advertising Clubs of America.

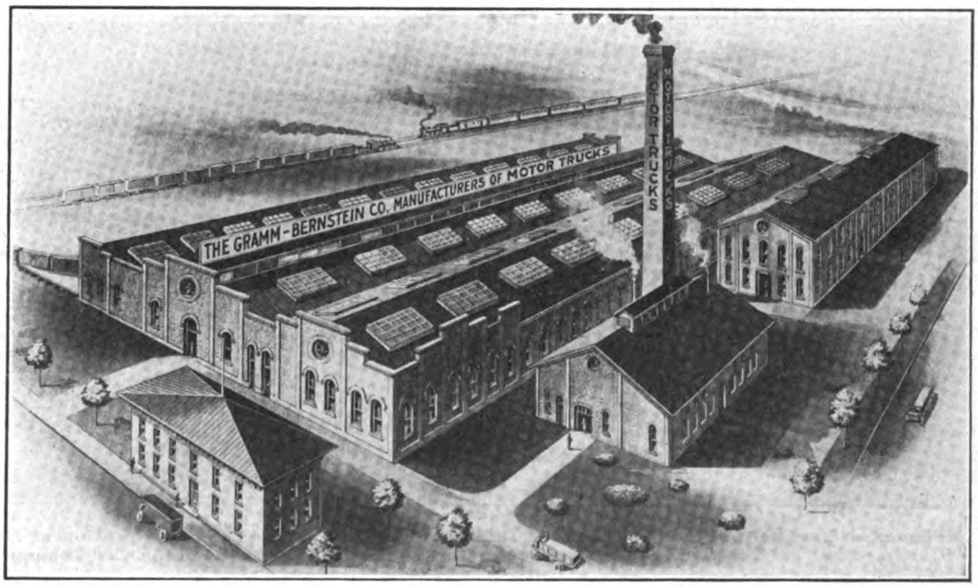
F. W. Kurtz has resigned as advertising manager of the General Motors Company after a campaign which has been very successful in paving the way for the sales department and giving the company an increased business. He will take a rest after which he will again identify himself with the automobile industry.

The K-R-I-T Motor Car Company, Detroit, maker of K-R-I-T cars, has established a factory branch at 1008 Commonwealth avenue, Boston, with Dayton G. True as manager. The retail sales agent for Boston and vicinity is F. E. Proctor.

The Gramm-Bernstein Company, Lima, O., has practically completed its new factory, which is expected to prove one of the largest plants in the country erected for the exclusive manufacture of motor trucks. With the exception of one building, all are of one story, from 50 to 63 feet wide, and running a total distance of 316 feet in length. No posts are to be found in any part of the plant, which is located along the main lines of two cellent manufacturing and shipping facilities.

The Oakland Motor Car Company, Pontiac, Mich., maker of Oakland branch at 5913 Baum street, Pittsburg, Penn., which will be under the management of Frank S. Odell.

The Herbert Manufacturing Company, Detroit, maker of automobile bodies, has secured plans for a one-story addition to its plant, to cost, it is understood, $45,000.


THE GRAMM-BERNSTEIN CO. MANUFACTURERS OF MOTOR TRUCKS
MOTOR TRUCKS
MOTOR TRUCKS

New Factory Buildings of the Gramm-Bernstein Company, Lima, O.

The Flint Axle Works, Flint, Mich., has been purchased by Thomas Walker, Superintendent Weiss and other associates, and the firm name will be changed to the Walker-Weiss Axle Works. The facilities of the plant will be greatly enlarged.

The Griffin Wheel Company, Chicago, will be reorganized under Massachusetts laws, it is reported. The present Illinois corporation has $8,000,000 capital stock. The new company, it is said, will have $12,000,000 authorized common stock, of which $9,500,000 will be issued and $9,000,000 authorized 6 per cent. cumulative preferred stock, $6,000,000 to be issued.

The Stens Manufacturing Company, Springfield, Mass., capitalized at $200,000, has purchased land in that city on the line of the new Hampden railroad, not yet built, and will erect a three-story factory building 100 by 40 feet. The company was organized last summer to make automobile tires.

The Stevens-Duryea Company, Chicopee Falls, Mass., has established headquarters at Toledo, O., and a display and salesroom will be opened there soon. C. B. Cook of Toledo has been appointed district manager and superintendent of the sales and service departments for the Toledo district.

P. J. G. Kelly, for many years connected with C. F. Splitdorf in the conduct of the latter's large magneto and ignition business, has severed his connection with the Splitdorf Electrical Company of New York City. Mr. Kelly has no plans for the future, but after a much needed rest it is said he will identify himself with a well known electrical concern. His connection with the Splitdorf company dates back a dozen years and his retirement comes as a surprise to the trade.

The Dahl Punctureless Tire Company of America has been organized under the laws of South Dakota. This company was organized for the purpose of taking over the business of the Dahl Punctureless Tire Company, a Minnesota corporation, but the transfer has not yet been made. The Minnesota concern still continues its business as heretofore, with headquarters at Minneapolis, for the present at least.

GARAGE & DEALER

H. F. Peterson, Chicago, is planning to build a two-story brick garage at 4254 Hazel avenue, to cost $3000.

J. C. Lewis, Savannah, Ga., formerly with T. A. Bryson, has secured the agencies for the Ford and Cole machines and has entered business for himself, now being busy making contracts for automobiles and supplies.

The Clearmont Motor Company, Clearmont, Mo., has been formed by Guy C. Clary, William G. Carpenter, Bert R. Reynolds and Fred C. Newlon to sell automobiles and do repair work. They have purchased two corner lots at Clearmont and also two lots adjoining the first purchase and will erect a building 40 by 80 feet.

L. S. Turner of Kansas City, Kan., has purchased the Abilene Garage, Abilene, Kan., of Herman Herr.

The Automobile Tire Filling Company of Maryland and District of Columbia has been incorporated to engage in the tire filling business. Headquarters have been established at 2207-2209 Madison street, Baltimore, Md.

The Westcott Motor Car Company, Little Rock, Ark., has taken the agency for the Pierce-Arrow cars, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y., for the state of Arkansas.

George Hummel, 25 North Dearborn street, Chicago, is to erect a one-story garage, to cost $16,000.

The Fisk Rubber Company of New York City has completed additions to its branch at 1725 Broadway, New York City. A new four-story and basement service building on 55th street has been merged with the quarters which front on Broadway. The branch is in charge of Jay B. Cothran.

Paul R. Pelz, who has been temporary director of the Benz Automobile Import Company, will soon return to the Benz headquarters at Mannheim, Germany. The management of the American branch will be taken by William F. Dietzsch, who has been previously connected with the automobile industry abroad.

The Federal Motor Supply Company, Cincinnati, O., has been formed with capital of $250,000 and will handle accessories and supplies for automobiles, trucks and motor driven vehicles of all kinds. Five retail houses are to be established immediately in the Middle West, which will draw their supplies from the Cincinnati house. The officers of the company are: President, George W. Platt; vice president, Fred H. Berold; secretary, Jesse W. Wozencraft; assistant secretary, F. W. Stukenborg, formerly with Coughlin & Davis; treasurer, Emil G. Schmitt.

Frank R. Parker, Boston, well known as Elmore agent in that territory since 1905, has joined the sales force of the Motor Car Manufacturing Company, Indianapolis, maker of the Pathfinder pleasure and commercial lines, representing the concern in New England with headquarters in Boston.

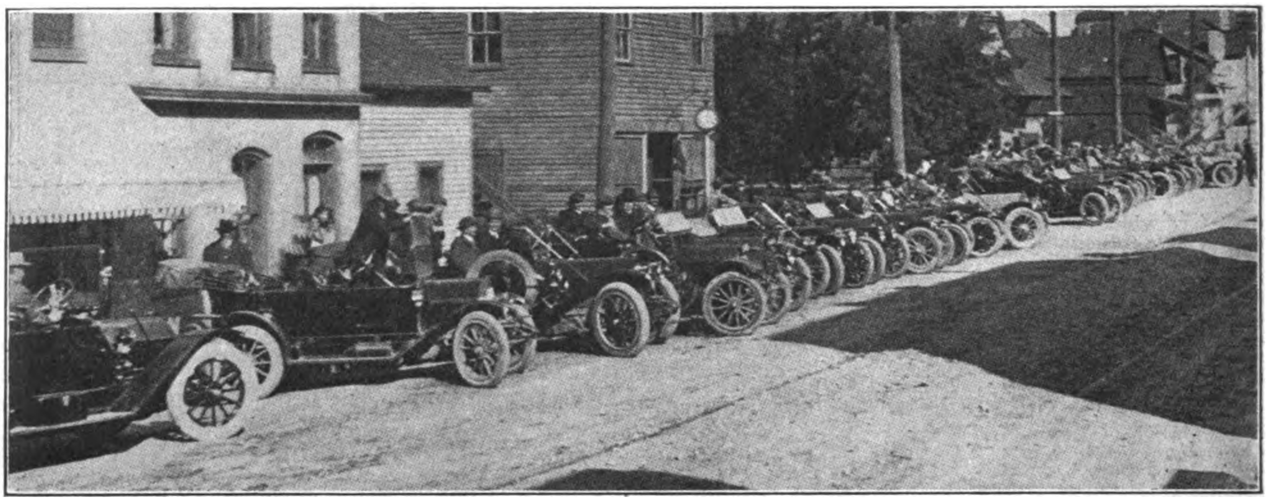
L. W. Place, at one time connected with the sales force of the Buick Motor Company, Flint, Mich., maker of Buick cars, and later with the Olds Motor Works, Lansing, Mich., maker of Oldsmobile machines, as assistant to the general manager, has been appointed foreign representative of the General Motors Company. He sailed from Vancouver, B. C., and his first stop will be Australia. He will be gone 18 months, during which time he will visit every country of note in the eastern hemisphere.

F. McFadden, formerly affiliated with the American Roadster Company, New York City, has signed a three years' contract with the Kline Kar Motor Company of Pittsburg, Penn., and will be sales manager of the Pittsburg district.

The Frederick E. Murphy Automobile Company, Minneapolis, Minn., is to erect a new and modern automobile building at Hennepin avenue and 13th street, to cost $140,000. The building will front 137 feet on Hennepin avenue and have a depth of 144 feet on 13th street. It will be three stories high and will have the largest showroom devoted to motor vehicles in the West. It will be ready by March 1.

A. G. Schonacker, general manager of the Marvel Carburetor Company, Flint, Mich., has resigned on account of ill health and expects to locate in the West, where he hopes to take up an agency in a section that will be conducive to building himself up physically. Mr. Schonacker joined the Marvel company when it was comparatively small and leaves it at a time when its output for the current year is contracted for.

H. R. Averill, who has been connected with the Pullman Motor Car Company, York, Penn., maker of Pullman machines, has resigned his position.



Members of the Milwaukee Merchants & Manufacturers Association Leaving Station at Hartford, Wis., in 24 KisselKars to Visit the Hartford Plant of the Kissel Motor Car Company.

David C. Fenner, Jr., New York sales manager of the International Motor Company, maker of Mack, Saurer and Hewitt trucks, has been promoted to be manager in full charge of the New York branch of the company, with all its territorial departments.

Col. K. C. Pardee, a pioneer of the retail trade, has resigned as general manager of the United States Motors New York Company, distributor of the Maxwell lines, to become identified with a concern now forming to enter the manufacturing field. The nature of the business has not been stated.

C. E. Osborn has been appointed Pacific Coast manager of the Speedwell Motor Car Company Dayton O., maker of trucks and pleasure vehicles, succeeding R. Harry Croninger, who will return to the Dayton factory to assume the management of the truck department, although retaining the presidency of the Pacific Coast branch.

William A. Baxter, formerly general sales manager of the Dayton Auto Truck Company, Dayton, O., maker of Durable Dayton motor trucks, has been appointed sales manager of the Pan-American Motors Company, San Francisco, distributor of the Durable Dayton trucks in the Pacific Coast states.

J. K. Gewinner, prominent in the automobile accessory field in Atlanta, Ga., has severed his connection with his former associates and organized the Johnson-Gewinner Company, at 83-85 North Forsythe street and 124 Peachtree street. The firm will carry a varied assortment of automobile accessories. It will also conduct a finely equipped shop in charge of a man educated at the factories, for the care of magnetos, carburetors, etc. The company will specialize in this work so as to give service and satisfaction to manufacturers whose lines have been neglected in that territory and whom Johnson-Gewinner Company will represent in a thorough manner.

Capt. John J. Seay has purchased of Capt. J. L. Bass, Rome, Ga., as an investment, the building now occupied by the Seay-McCartha Garage & Auto Company and the Southern Steam Laundry on East First street. He will remodel the building for the exclusive occupancy of the garage. The consideration is said to have been $14,000.

R. S. Keeves, Oregon, Mo., has disposed of his interest in the J. H. Keeves Automobile Company, to his son, John H. Keeves, for $6200. The latter has sold a half interest to H. G. Cook and the firm is now known as the Keeves-Cook Auto Company.

Simon Westra and Edward Van Woudenburg have taken charge of the Parkinson garage, Rock Valley, Ia., which they recently purchased.

E. E. Harlan and John Pitka have purchased the interests of Clinton Fosnacht and L. L. Hufford in the National Auto Specialty Company, Tama, Ia.

A. I. Reifsnider, Baltimore, Md., has purchased a large commercial garage on the west side of Madison avenue, between Lafayette avenue and Mosher street. The consideration is said to have been $15,000.

F. O. Calkins and John Thompson, Wadena, Minn., propose to enlarge their garage to double its present capacity and the work has already been begun.

D. C. Hathaway, assistant sales director of the Foraker-Dayton Motor Truck Company, reports that an agency will be established at St. Louis, Mo., of which Allen Baker will be manager.

J. H. Hileman, Waterloo, Ia., has taken the agency in that city for the Haynes line, made by the Haynes Automobile Company, Kokomo, Ind., and has established headquarters at 310 West Park avenue.

W. L. McQuerry, De Soto, Ia., has established a large and modern garage in the Hich building, that city.

Frederick W. Davis, Fall River, Mass., has purchased property on North Main street and will open an up-to-date garage and machine shop.

Frank L. Seaker and Elmer C. Curtis, Watertown, N. Y., have secured the building formerly occupied by the Abbott shirt factory, which they are having remodelled and converted into a garage.

The M. & A. Garage is the name of the new establishment opened in the Gowdowsky building, Macomb, Ill., for the care and repair of motor vehicles. The firm is composed of J. C. McDonald and Joseph Atherton.

Rekenthaler & Heilman, Cushing, Ia., has dissolved partnership, Mr. Rekenthaler retaining the garage in his own name.

The Service Motor Company, Antigo, Wis., has purchased the garage at 626 Superior street. G. A. Zwicky and F. J. Zwicky have been put in charge.

The Heitz Garage on East Second street, East Hill, Ia., is being enlarged by an addition to be absolutely fireproof.

The South Dakota Cadillac Company, Watertown, S. D., is planning extensive improvements and enlargements for the 1913 season.

Frank Leamer of Brooklyn, N. Y., is to erect a two-story brick garage at Caton avenue and East Second street, that city, at an expenditure of $10,000.

The Barker, Rose & Clinton Company, Elmira, N. Y., has opened a new supply department and will cater to the automobile trade.

A. D. Russell of Princeton, N. J., will erect a six-story garage on West End avenue, between 63d and 64th street, New York City, at an estimated cost of $250,000, for the International Motor Company.

NEWS NOTES OF THE INDUSTRY.

(Too Late for Classification in Previous Pages.)

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Star Motor Car Company, Augusta, Me.; $500,000; to deal in automobiles; president, N. L. Goodall; treasurer, W. N. Sanborn.

LaFayette Motor Sales Company, Inc., Buffalo, N. Y.; $10,000; incorporators, Annie E. Groh, Frank J. Batt, Joseph A. Groh.

General Rim Company, White Plains, N. Y.; $150,000; to deal in motor vehicles and parts; incorporators, Robert W. Ashley, Frank Oberkirch, William Kaul.

Maine Power Truck Company, Portland, Me.; $10,000; general garage business; president, Irving L. Peabody; treasurer, George E. Peabody.

Joliet Auto Supply Company, Joliet, Ill.; $5000; incorporators, Ben S. Moore, Thomas J. Bracker, John H. Garnsey.

Atlas Tire Company, Inc., 1771 Broadway, New York City; $10,000; automobile tires; incorporators, Ralph W. Morrison, R. D. Placak, F. F. Nichols.

American Auto Radiator Works, Newark, N. J.; $25,000; to manufacture radiators, automobiles, auto trucks, etc.; incorporators, Max Steiner, S. Goldstein, A. Marcus.

City Automobile Company, Morgantown, W. Va.; $4800; to manufacture, buy and sell automobile supplies, operate garage; incorporators, J. Leonard Yates, B. S. Dearing, N. B. Yost, Margaret Smith, Cora B. Dearing.

Motor Supplies Company, Chicago; $5000; manufacturing and dealing in automobiles, automobile parts and supplies; incorporators, H. C. Maibolm, P. W. Gillett, E. M. Beauchamp.

Blue Ridge Motor Company, Waynesville, N. C.; $25,000; incorporators, G. H. Paddock, James Atkins, Jr., H. Rotha.

Perfection Automobile Supply Company, New York City; $15,000; to manufacture automobile parts, deal in automobiles, etc.; incorporators, James V. Simpson and others.

Tibbetts & Co., Trenton, N. J.; $10,000; general automobile and motorcycle business; incorporators, George Tunnicliffe, E. Knapp, Joseph Tibbetts.

Distributing & Importing Company, New York City; $100,000; automobiles, motor vehicles and biplanes; incorporators, Paul Lacroix, Harvey T. Andrews, Henry A. Miller.

De Lion Tire & Rubber Company, Jersey City, N. J.; $500,000; general automobile business and manufacturing rubber goods; incorporators, H. O. Coughlan, T. K. Mallaby, H. T. Letts.

Commercial Garage Company, Newark, N. J.; $10,000; general automobile business; incorporators, L. Kirkpatrick, R. O'Gorman, S. A. Young.

Nyberg Automobile Company of New Jersey, Newark, N. J.; $25,000; general automobile business; incorporators, C. Hallock, F. F. Moore, A. E. Hartcorn.

Sternberg Motor Truck Company, New York City; $25,000; incorporators, Bruno Sternberg, Eugene P. Harrman, Ernest M. Sternberg.

Amherst Garage Company, Amherst, Mass.; $15,000; incorporators, H. E. Paige, Louis E. Smith, C. H. Buell.

National Automobile Owners' Association, Asbury Park, N. J.; $25,000; automobile business; incorporators, A. M. Hushart, W. F. Paterson, D. W. Edwards.

GARAGE AND DEALER.

The Lozier Sales Company, with capital of $50,000 subscribed by prominent men in Akron, O., has been organized in Cleveland, O., to take over the business of the factory branch formerly conducted in that city by the Lozier Motor Company, Detroit, maker of Lozier cars. A. W. Woodruff has been appointed manager. The salesroom is located at 2336 Euclid avenue.

The Lambert Auto Company, Baltimore, Md., has been appointed agent for the Church-Field electric pleasure cars, made by the Church-Field Motor Company, Sibley, Mich.

G. F. Green, Brewster, Wash., has taken the agency for the Ford car, made by the Ford Motor Company, Detroit, and will establish a garage in that city.

The General Motor Car Company, Philadelphia, Penn., agent for Lozier, Paige-Detroit and Rauch & Lang electrics, has leased premises at 21st and Ludlow streets, containing 52,000 square feet of floor space for salesrooms, repair, paint and body shops. After an expenditure of $40,000 to adapt the building to its uses, the company will occupy it in the near future. Until that time it will be in its old quarters at 227-229 North Broad street.

The Meriden Auto Service Company, Meriden, Conn., has been formed to buy and sell automobiles and motor trucks, with offices at 35 State street. The officers of the company are: President, Dr. H. L. Patzold; secretary, Paul C. Booth; treasurer, William H. Cumberidge.

James S. Butler is occupying his new garage, which has just been completed on New Derby street, Salem, Mass. The structure is held to be absolutely fireproof.

The S. L. Crosby Company, Bangor, Me., has moved into its new fireproof garage on Salem court. The firm now has one of the largest workshops devoted to automobile repairing in Maine. The company has the agency in eastern Maine for the Ford car, made by the Ford Motor Company, Detroit.

The Kansas City Automobile Supply Company, 1504 Grand avenue, Kansas City, Mo., has purchased of J. C. Gates 49.5 feet of land on McGee street between 18th and 19th streets, at a cost of $25,000. The company will erect a four-story building on the site, to cost $40,000.

F. J. Tyler of the Tyler Bros. Corporation, Boston, has announced the establishment of a factory branch to handle in New England the products of the Little Motor Car Company and the Chevrolet Motor Company, both of Flint, Mich., and both controlled by the Republic Motor Company, Detroit. The branch will be conducted under the style of Republic Motor Company of Massachusetts and will be under the management of W. C. Sills, who has been assistant manager of the Buick Boston Motor Company for the past three years.

The Van Vliet-Bradt Motor Company, Des Moines, Ia., has been incorporated with a capital of $10,000 and quarters have been secured at 919 West Locust street. The officers of the new company are: President, W. E. Moyer; vice president, W. J. Bradt; secretary and treasurer, C. G. Van Vliet.

The Reliance Automobile Company, San Francisco, Cal., has secured new headquarters at 1655 Van Ness avenue, formerly occupied by the Stearns Company. The building will be remodelled and Knox pleasure cars and Detroit electrics will be handled. The salesroom for the Knox trucks and the repair and service departments will be at the company's machine shops, 547-557 Fulton street, which will be in telephonic communication with the headquarters on Van Ness avenue.

Henry Donnecke of Le Claire, Ia., has purchased the interest of C. S. Fries in the Fries & Dittmer garage.

The Gamble Motor Car Company, Toledo, O., owned by Carl and Lyman Spitzer, has decided to build an addition to its headquarters at 1211-1215 Madison avenue.

Lon Gephart of New Castle, Ind., has opened a modern automobile repair shop at 311 North 11th street.

W. M. Chellis, Portland, Me., has purchased the garage at the rear of 684 Congress street and has added a first class service station in which all kinds of repair work will be undertaken.

The Weller Auto Company, Bay City, Mich., is a new concern which has located at 905 Saginaw street.

Simpson, Swain & Simpson, Gridley, Cal., has purchased the City garage, heretofore conducted by J. F. Shaeffer & Son, and will operate it in connection with its original garage.

O. R. Fuller, Los Angeles, Cal., has secured plans for the erection of a garage at 719 North Alameda street, to cost $20,000.

The Meyer-Busch Auto Company, St. Louis, Mo., is now in its new home at 5072 Delmar boulevard. The sales department is in charge of W. G. Laves.

The St. Louis Lozier Company, St. Louis, Mo., has been incorporated with capital stock of $25,000, to handle the Lozier car, made by the Lozier Motor Company, Detroit. H. B. Graham is president and Nelson S. Getshall is vice president and general manager. The office is at 4160 Olive street.

The William E. Ball Auto Company, 115 East Markham street, Little Rock, Ark., which has the state agency for the Cole machines, made by the Cole Motor Car Company, Indianapolis, Ind., has secured the agency for Packard cars, made by the Packard Motor Car Company, Detroit.

William B. Waters and Fred Waters, who at present conduct the Red Bank garage, Red Bank, N. J., have purchased of Morgan V. Disbrow the large two-story brick garage on Bridge avenue, recently erected by the latter.

The New Automobile Company, Jacksonville, Fla., has entered business in that city and has opened a garage at 919-921 Main street. Judge H. B. Phillips is president and N. B. Downey is sales manager.

John Christensen & Co., Galveston, Tex., is to erect a building on Tremont street similar to the one recently built for the company on Church street, both to be used for its automobile business. The cost will be $20,000.

The Star Garage, Mishawaka, Ind., has been purchased by Robert Harvey, owner of the Harvey Auto Livery, operating for some time at Mishawaka and South Bend. M. W. Stark, Elkhart, Ind., was the former proprietor.

The Southern Motors Company, Louisville, Ky., has taken over the garage of the Miles Auto Company, 615 South Third street. The Packard cars, formerly handled by the Miles company, will now be distributed by the Southern Motors Company, which also distributes Hudson cars, made by the Hudson Motor Car Company, Detroit.

The Tudor Garage on Washington avenue, Chelsea, Mass., has been purchased by L. and S. Gale of Everett, Mass., and business will be conducted under the firm name of L. Gale & Son. Harry Snowman will be retained as assistant manager. Samuel Gale will be manager and treasurer.

George Figel, who has temporary quarters on University avenue, San Diego, Cal., has secured a lease of a new garage which will be erected at City Heights at a cost of $10,000, by S. M. Toole, capitalist. The building will contain all the modern apparatus for repair work.

J. S. Morrison is manager of the new agency at Phoenix, Ariz., which will distribute the Hupmobile, made by the Hupp Motor Car Company, Detroit, in Arizona and New Mexico. The distributing agency does not conflict with the retail agency conducted at Phoenix by John A. McCondra and L. E. Hoeye, with offices at First and Monroe streets.

The Stewart-Borcher Auto Repair Company, Waterloo, Ia., has located a first class repair shop at 219 East Sixth street, where repairs to all makes of cars will be undertaken. A complete line of supplies is to be kept in stock and the company intends to add a new automobile to its line in the spring.

The Blackhawk Auto Company, Waterloo, Ia., will move to larger and more modern quarters in the near future.

The Barr-Morgan Auto Company, Sioux City, Ia., has located at 525 Sixth street and will handle the Cole machines, made by the Cole Motor Car Company, Indianapolis, Ind.

J. W. Mooman has sold his interest in the Urbana Auto Company, Urbana, Ill., to his partner, John F. Miller. F. L. Cannon is manager.

The Iowa Auto & Tire Company, Davenport, Ia., has been reorganized and will be known in future as the Iowa Taxicab Company. It is located at 112 Commercial alley and has the agency for the Pierce-Arrow cars, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y.

W. L. Bunker and A. V. Reopell, well known in automobile circles, have opened salesrooms on Fort street, Springfield, Mass., having formed a company to handle the Rambler, Little and Chevrolet cars. Plans are being made for doing an extensive business.

The Cole Motor Car Company, local branch, Indianapolis, Ind., has completed the equipment of its new service station at 524 North Capitol avenue. It occupies two floors of one of the handsome concrete showrooms which form Automobile row in Indianapolis. One unique feature is a bell on the outside of the building by which the passing motorist can summon the foreman without delay.

The Isotta Fraschini Motors Company, New York City, is now in its new quarters at 1920 Broadway. The change in location was due to the fact that the company had outgrown its old quarters. A service station, with a full and complete stock of parts has been established on the third floor and excellent service will be given to owners of Isotta cars.

The Thomas B. Jeffery Company of California, San Francisco, Cal., has moved into its new three-story building on 12th street near Market street, where more than 30,000 square feet of floor space will be devoted to the care and sale of Rambler cars, made by the Thomas B. Jeffery Company, Kenosha, Wis. The lower floor cares for the general offices, the display room, parts department and space to make minor repairs and adjustments. The second floor will be given over to the storage of new cars and the top floor will be devoted to the machine shops and general repair work. No delay will be encountered in any department of the firm, which now enjoys as good facilities as any on the Pacific Coast.

Charles Wedding, Jerseyville, Ill., has purchased the interest of his partner, Clarence Heidscheid, in the firm of Wedding & Heidscheid, and will continue the business alone.

A. F. Shallberg, Moline, Ill., is to open the first exclusively electric garage in that city, at 1521 Library avenue. He will handle the Rauch & Lang line.

The Robertson Tire & Auto Company, Birmingham, Ala., is a new concern formed with W. W. Robertson as manager. Associated with him are J. E. Vandergriff and E. R. Minhinnette. It will handle Cole cars, made by the Cole Motor Car Company, Indianapolis.

Morrison & Dains, Mount Pleasant, Mich., has sold its repair shop to C. A. Kellogg and J. M. Taggart, who will move the plant from South Main street to 220 East Broadway.

The Hailey Auto Company, Hailey, Idaho, has been reorganized and will be operated in future under the name of the Fowler, Stimson & Furcht Auto Company.

The Maurer Garage Company, Sheboygan, Wis., has been dissolved and its business taken over by the Sheboygan Auto & Supply Company. C. F. Kade, Caroline F. Thieman and Felix Benfry are the incorporators of the new concern and Carl Kade and Robert Thieman will manage the business.

S. E. Brune & Son, Woodburn, Ore., has purchased the Public garage, automobile and repair business of L. M. Remington, on South First street. They have the agency for the Michigan line, made by the Michigan Motor Car Company, Kalamazoo, Mich., in addition to motorcycles and bicycles.

Harold E. Wolcott has established a salesroom at 100 Cass street, Joliet, Ill., in which he will handle the Cadillac cars, made by the Cadillac Motor Car Company, Detroit.

The Akron Tire Company, Philadelphia, Penn., has opened a branch at 1024 14th street, Washington, D. C., with N. A. Brandriff as manager.

The Mason City Vulcanizing Company, Mason City, Ia., has been formed by Nels Narveson and W. A. Childress, who will conduct a repair shop.

The Co-Operative Auto Company, St. Paul, Minn., has secured the garage at 199 West Fifth street. The firm will do a general garage business, including storage and repairing. S. W. Wicks is president of the concern.

Peddycort & Lahr, Cheyenne, Wyo., have opened a garage at 19th and Thomas streets and will do a general repair business.

The Williams-Hasley Motor Car Company, Pittsburg, Penn., has just moved into its new quarters, Baum street and Euclid avenue, where a first class service station will be maintained.

The Luttrell Company, Washington, D. C., has opened its new service station and garage on New Hampshire avenue. The building is the largest of its kind in the city, two stories high and of steel and concrete construction.

The City Auto Company, Athens, O., is to reconstruct its Carpenter street garage into a building three times its present size, which will be occupied exclusively by this company. Work will begin immediately.

The Missouri Taxicab Company, St. Louis, Mo., has purchased land on Euclid avenue upon which it will erect a garage building to cost $25,000.

A Few of the 410 Members of the Cleveland Chamber of Commerce Visiting the Plant of the B. F. Goodrich Company, Akron, O.

W. H. Shimman of Toledo, O., will erect in the spring a garage fronting on Mason street. The establishment will have modern facilities.

F. S. Cropley has taken over the old Federal tire agency at St. Louis, Mo., and established a factory branch at 4628 Olive street. He will handle a complete stock of tires and tire accessories.

WITH THE MANUFACTURERS.

The B. F. Goodrich Company, Akron, O., maker of Goodrich tires, recently entertained 410 members of the Chamber of Commerce, Cleveland, O., at its factory. The task of meeting and arranging these guests so that each should obtain accurate information concerning the various departments of the plant, which affords 65 acres of floor space, was carried out successfully. An accompanying illustration shows a portion of the party about to enter one of the buildings.

The Knight Tire & Rubber Company, Canton, O., maker of Knight tires, has opened a branch office at 221 Peachtree street, Atlanta, Ga., under the management of H. C. Ross, for the past seven years connected with the Diamond Rubber Company's interests in the South. The branch will be the general distributing point for six or seven states surrounding Georgia.

The R-C-H Corporation, Detroit, maker of R-C-H cars, has signed the following 1913 contracts: Rudolph Dittmar, Massbach, Ill.; Perry & Westin, Newberry, Mich.; Barry Garage, Chicago; W. W. Calhoun, Fort Gaines, Ga.; K. W. Detwiller, Palmerton, Penn.; Max Wolcott Garage, Corning, N. Y.; A. S. Baker & Son, Stratton, Col.; Newton Root, Kalamazoo, Mich.; Grant S. Emery, Jonesville, Mich.; A. H. Hancuff and W. Shelly, Williamsburg, Penn.; P. E. Weimer, Rockwood, Penn.; The Corn Belt Auto Company, Waterloo, Ia.; Davis & Turney Company, Dallas, Tex.; Ernest C. Currier, Ipswich, Mass.; W. H. Carll & Sons, Rochester, N. H.; William G. Dupont, Berlin, N. H.; E. J. Weese, Ipava, Ill.; Terre Haute Machine Works, Terre Haute, Ind.; George McDonald, Akron, Col.; Ray Danner, Loveland, Col.; Fancher Bros., Evanston, Ill.; Shean Auto Station, Springfield, Mass.; W. D. Havens, Schenectady, N. Y.; A. H. Wilson Motor Car Company, Canton, O.; K. A. Knudson, Delhi, Minn.; W. F. Schroeder, Danube, Minn.; Martin Rimestad, Olsen, N. D.; Lon Sellars, Amarillo, Tex.; Walter-Hafner Jewelry Company, Hillsboro, Tex.; G. R. Daniels, Olean, N. Y.; B. D. Smith, Odell, Tex.; J. N. Ginter, Wooster, O.; Beyer & Feakes, Hackensack, N. J.; Karlson's Garage, Hicksville, N. Y.; W. S. Lawrence, Moira, N. Y.; Julius Lichtenstein, New York City; N. C. Doering, Gaylord, Minn.; R. J. Orchard, Garske, N. D.; J. B. Siegfried, Canbridge, O.; George D. Woods, Mancos, Col.; Elm City Publishing Company, Waterville, Me.; Kansas Motor Car Company, Wichita, Kan.; Dupont Motor Company, Washington, D. C.; Westcott Motor Car Company, Little Rock, Ark.; Modern Garage, Jacksonville, Ill.

William H. Hotchkiss of Buffalo, N. Y., formerly a member of the American Automobile Association and also state superintendent of insurance of New York State at one time, has been elected president of the twin automobile insurance companies, known as the National Motor Indemnity Company and the National Motor Insurance Company of New York City.

The Fisher Auto Top Company, Norwalk, O., manufacturer of automobile tops, has extended its factory facilities and in addition to its quarters on West Seminary street has occupied space in the Hull building on Hester street.

The Cole Motor Car Company, Indianapolis, Ind., has appointed the following agents for 1913: F. W. Davis & Sons, Fall River, Mass.; Palace Auto Station, Worcester, Mass.; Pawtucket Auto Company, Providence, R. I.; Anderson Automobile Company, Anderson, Ind.; W. H. Dykeman, Bayonne, N. J.; Hager Bros., Baxter, Ia.; A. H. Krauss & Co., Blue Springs, Neb.; Churchill & Lockwood, Burlington, Vt.; J. R. King, Charleston, W. Va.; Kehay L. Hosmer & Co., Cairo, Ill.; E. J. Quigley, Canton, O.; Guy Coleman, Canton, Ill.; Ostrand & Lampert, Cedar Bluffs, Neb.; D. Scott Thompson, Clarksburg, W. Va.; W. E. Campbell, Clarksdale, Miss.; Covington & Smith, Clio, S. C.; A. J. Dischner, Columbus, Neb.; Franklin Cycle & Supply Company, Columbus, O.; Letts Farrell Company, Cortland, N. Y.; Boehmer & Sheridan, Fort Smith, Ark.; J. R. Kiser, Fremont, O.; W. S. Wright, Greenwood, Miss.; B. L. Lyford, Helena, Ark.; Townsend & King, Itta Bena, Miss.; L. F. Weathersby, Jonestown, Miss.; Craven & Moberly Company, Kellogg, Ia.; L. L. Sybee & Co., Knoxville, Ia.; Alfred Lofland and C. E. Layton, Lebanon, Ind.; E. Norwuist, Lexington, Miss.; Miles Auto Company, Louisville, Ky.; Cary S. Davis, Ypsilanti, Mich.; William Hillsamer & Son, Marion, Ind.; W. B. Park, Marigold, Miss.; Tipping Bros., Marshall, Mo.; J. H. Fisher, Marshalltown, Ia.; Clover Leaf Company, Mason City, Ia; W. M. James, Merida Yucatan, Mex.; E. S. Curtis, Meridian, Miss.; Bloch Bros., Mobile, Ala.; W. M. Moore & Co., Moro, Ore.; J. M. Granberry, Mt. Pleasant, Tenn.; Knight Garage, New Haven, Conn.; Lathrop & Smith, New London, Conn.; Crow & Marder, Oakland, Miss.; Oblong Auto Company, Oblong, Ill.; C. H. Weaver, Oil City, Penn.; Oklahoma Motor Car Company, Oklahoma City, Okla.; Trerir & Snyder, Rock Island, Ill.; Harry W. Smith, Scranton, Penn.; W. K. Nulsen, Shreveport, La.; R. W. Russell, St. Marys, W. Va.; Bagnell Auto Company, St. Louis, Mo.; X. A. Oliver, Summerville, Tenn.; J. B. Pennington Company, Tarboro, N. C.; J. B. Kirk, The Dalles, Ore.; H. C. Van Meter, Van Meter, Ia.; A. W. Lee, Wheeling, W. Va.; Wedge Garage Company, Zanesville, O.; J. P. Rusthoi, Arenta, Cal.; W. B. Thompson, Atlantic City, N. J.; A. W. Tindall, Hartford City, Ind.; C. L. Young, Norfolk, Va.; Reo Nevada Company, Reno, Nev.; B. E. Parker, Suffolk, Va.; Kirkew & Ickman, West Point, Neb.

J. C. Ayres has been appointed manager of the newly completed Detroit branch of the General Motors Company at Fort street, 12th street and Lafayette boulevard. Mr. Ayres has been connected with the motor truck industry since its early inception.

The Lavigne Gear Company, Corliss, Wis., has leased the plant of the Racine Sattley Company, Racine, Wis., which recently suspended operations, and will manufacture steering gears.

The Motor & Accessory Manufacturers' Association has elected the following concerns to membership: John W. Blackledge Manufacturing Company, maker of auxiliary springs and shackles and automobile accessories, 2210 Michigan avenue, Chicago; James L. Gibney Rubber Company, rubber tires, rubber goods and vulcanizers, 215-217 North Broad street, Philadelphia, Penn.; Westinghouse Electric and Manufacturing Company, electric vehicle motors, ignition and lighting systems, East Pittsburg, Penn.

JEFFERY-DEWITT COMPANY
MANUFACTURERS OF
J-D VISIBLE AND RELIANCE SPARK PLUGS
JEFFERY-DEWITT CO. PLANT NO. 2.
JEFFERY-DEWITT PLANT NO. 2

New Factory of Jeffery-Dewitt Company, Detroit, Known as Plant No. 2.

The Universal Wheel Company, Fort Wayne, Ind., with a capital stock of $1,000,000, will establish a large factory in that city for the manufacture of puncture proof automobile wheels. Temporary quarters have been secured on Pearl street.

The Parker Motor Company, Detroit, Mich., has been formed to manufacture a rotary valve motor and temporary quarters have been established at 660 Grand River avenue. V. C. Parker, formerly of Winnipeg, Can., is the manager.

The Marshalltown Motor Material Manufacturing Company, Inc., Marshalltown, Ia., or as it is generally known, the M. M. M. M. Company, Inc., has filed with the secretary of state a revision of the corporate name and will be known in the future as the V-Ray Company, Inc. The company produces the V-Ray spark plug and is enlarging its facilities anticipating a five-fold increase in output for the next year. The product will be displayed at booth 629 at the Madison Square Garden show in New York City, and booth 31 in the Chicago exhibition.

The Jeffery-Dewitt Company, Detroit, maker of Reliance and the new J-D Visible spark plugs, has been forced by increasing business to occupy another building, affording 6000 square feet of floor space, in addition to its original quarters. This is shown herewith and will be known as plant No. 2. It is located on East Grand boulevard, and from this point the entire assembling and shipping will be carried on. The old factory, which will be known as plant No. 1, will be devoted solely to the manufacturing of porcelains and the machining of metal parts.

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THE ACCESSORY AND GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., DECEMBER, 1912. No. 8

STEWART AND WARNER COMBINE.

New $11,000,000 Corporation Takes Over Business of Two Old Companies---Alliance Between Two Well Known Electrical Houses---New Car and Accessory Manufacturers Announced---Changes Among Official Heads.

The Stewart-Warner Speedometer Corporation was organized Dec. 19, under the laws of Virginia with a capital of $11,000,000, taking over the entire stock of the Stewart & Clark Manufacturing Company, Chicago, and the Warner Instrument Company, Beloit, Wis. The new concern also will acquire all of the speedometer patents owned by the Warner Instrument Company, A. P. Warner, C. H. Warner and J. K. Stewart.

The officers, directors and sales forces of the Stewart and Warner companies will remain as before, and the product of each factory will be marketed separately. Whiteweld & Co., a New York and Chicago banking house, underwrote the proposition and financed the purchase. J. K. Stewart will be president of the new company and C. B. Smith secretary and treasurer. The board of directors will be composed of representatives of the selling interests and of the banking house.

ALLIANCE OF ELECTRICAL CONCERNS.

Western Electric Company Becomes United with Pittsfield Spark Coil Company.

An alliance between the Western Electric Company, New York City, and the Pittsfield Spark Coil Company, Dalton, Mass., about which rumors have been in circulation for some time, has been confirmed by both firms. It has been expected that since the enormous increase in the use of electrical apparatus with gasoline automobiles one of the big electrical companies would take up this branch of the business. The Western Electrical Company is one of the biggest companies in the United States, doing $70,000,000 business a year, and the new alliance places it back of a line of ignition devices having a reputation for high quality such as the Pittsfield products have always enjoyed. The large engineering force of the Western company will work in conjunction with the Pittsfield engineers in developing new apparatus.

Under the arrangement between the two companies the entire line of Pittsfield products including magnetos, spark coils, spark plugs, timers and switches are now to be marketed exclusively by the Western Electric Company, under the name of Western Electric-Pittsfield. For a time the Pittsfield company will continue to market some magnetos direct. The sales efforts of the Western Electric Company will be directed largely towards manufacturers and supply houses. Ample stocks will be carried at each of the 28 Western Electric distributing houses located at shipping centres throughout the country. This brings the Western Electric-Pittsfield products within over-night shipment of every automobile manufacturer, dealer and owner. It is understood that beginning Jan. 1 a sales campaign will be launched covering the entire line of devices which has been materially extended to take care of the allied business.

TWO LEAVE ABBOTT COMPANY.

Report That Spitzley and Bush Have Resigned Causes Much Surprise.

B. C. Spitzley, assistant general manager, and W. T. Bush, general sales manager of the Abbott Motor Company, maker of Abbott-Detroit cars, have been reported as having resigned their positions. No reasons were given for the action and neither man would make any comment upon the matter, while the officials of the Abbott company were equally as reticent.

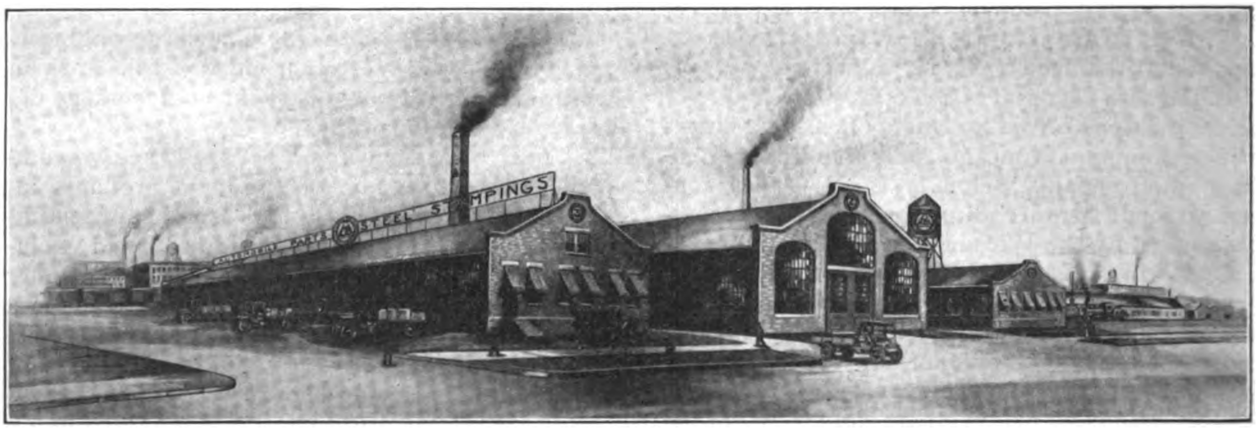
It was stated that nothing would be given out by the company until a later date. Both men have been connected with the concern for a long time and the report came as a distinct surprise to the trade. Mr. Spitzley recently returned from a business trip of two months through the West, at which time he reported trade conditions as exceptionally good.

TO BUILD NEW FACTORY.

Guide Motor Lamp Company Has Outgrown Its Present Quarters in Cleveland.

As an evidence of the permanent popularity of electric lighting for automobiles it is only necessary to point to the steady increase in business which has been enjoyed by the makers of such equipment during the past year. The Guide Motor Lamp Company, Cleveland, O., is another concern which has outgrown its present factory and facilities for production.

This company is erecting and will soon move into a strictly modern factory building occupying the entire block between 114th and 115th streets, on Madison avenue in that city. It will afford 14,000 square feet of floor space and will be equipped with the latest improved machinery for the manufacture of Guide electric lamps.



General View of the Davies-Bach Manufacturing Company's New Plant at Alliance, O.

UTAH DEALERS COMBINE.

Unite in Effort to Solve Second Hand Car and Other Problems.

The Utah Automobile Trades Association is the name of a new association of automobile, tire and accessory dealers which has been organized at Salt Lake City to protect its members from some of the evils which have grown up in the trade. The new body has opened an office at 251 State street, Salt Lake City, with a manager in charge. The question of credits will be handled through a credit bureau within constant telephonic communication with its members.

The second hand car situation, which is attracting attention throughout the country, will also be handled by dealers in this manner. When an offer is made on a second hand car by any member of the association this offer is immediately telephoned to the central office. Such information is confidential, but in case the person wishing to dispose of his car goes to another dealer, such dealer can find out by telephone just how much has been offered on this particular car, although the name of his competitor is not given. In this manner dealers are at all times protected from persons who go from one to another, getting them to bid against each other by inflating the price which has been offered.

Other important problems will also be handled in a manner of benefit to the members. The new association is composed of all the large concerns in the state and nearly all the smaller ones as well.

NEW ACCESSORY CONCERN.

Davies-Bach Manufacturing Company Will Locate Plant in Alliance, O.

The Davies-Bach Manufacturing Company, Cleveland, O., has been incorporated under the laws of Ohio and will locate its factories in Alliance. The concern has acquired 17 acres of land on the main line of the Pennsylvania railroad and three buildings already have been erected. Its own list of patented specialties, including radiators, airless tires, horns, etc., will be produced.

The manufacturing end of the business will be in charge of Supt. John Hughes, who for the past four years has been superintendent of the Kinsey Manufacturing Company, Toledo, O. He will be remembered as having been identified prominently with the Hydraulic Pressed Steel Company and Parrish & Bingham, both of Cleveland.

The officers of the company are: President. C. H. Davies, a western capitalist and an experienced automobile man; vice president and secretary-treasurer, J. J. Schmitt, formerly chief auditor of the Packard Motor Car Company, Detroit; directors, George R. Nash, prominently connected with the People's State Bank of Detroit; C. F. Bach, of the Michigan Sugar Company, Sebewaing, Mich., and W. F. Schmitt, also of Sebewaing.

An accompanying illustration gives a splendid idea of the present plant. Factories 1 and 3 are 52 by 206 feet and No. 2 is 63 by 206 feet. These are of the class A construction and were erected by the McClintic-Marshall Construction Company of Pittsburg, Penn. Plans for other buildings already are under way.

INCREASING CAPITAL STOCK.

Croxton Motor Car Company Finds It Necessary to Double Its Output.

The Croxton Motor Car Company, Washington, Penn., maker of the Croxton line, was organized Oct. 23 with authorized capital of $300,000. Of this amount $180,000 was paid in, leaving a balance of $120,000 in the treasury. A few days ago the company closed a contract with a Chicago house for more cars than it was originally intended to build. This, with the contracts already closed, made necessary an additional capital of $100,000, making a total of $400,000.

The capacity of the new plant, which is an all steel structure, with concrete floors, 500 by 120 feet, is rated at 1000 cars, but it is the desire of the stockholders to increase this at once to a capacity of 2000 machines. It is expected that 200 men will be at work by the first of the year, and that deliveries will begin about Feb. 15.

The officers of the company are: President, J. P. Stoltz; vice president, B. D. Arthur; secretary, G. W. Dudderar; treasurer, J. B. Allison. Mr. Arthur, who formerly was western sales manager of the Ohio Motor Car Company, Cincinnati, O., has been made sales manager of the Croxton concern.

UNITED STATES MOTOR COMPANY.

Plans for Reorganization Expected to Be Carried Through with Success.

While definite details regarding the reorganization of the United States Motor Company must await the court's action with respect to the sale of the present company's holdings, which has been set for Jan. 8, it is understood that there is every indication that the plans will meet with success.

A number of stockholders, the total reaching nearly 50,000 shares, are said to have failed to accept the proposition to subscribe $24 a share in the reorganization scheme, but it is announced in New York that the underwriting firm of Hallgarten & Co. is prepared to pay any assessments not met by stockholders.

In the meantime preparations are under way to remove the headquarters of the company from New York to Detroit, although it is not expected that this will take place until after the sale has been confirmed. Several department heads are said to have resigned, and there is every indication that steps are being taken to insure an early return to business activity, as soon as legal proceedings have reached a point where a definite policy can be decided upon.

The Brush and Sampson plants are understood to be idle, except for the production of spare parts. The Stoddard-Dayton factory has completed its schedule and the Columbia organization is said to be finishing the last of its work. The Maxwell's chief plant at Tarrytown, N. Y., is still active, but the factories in Newcastle, Ind., and Providence, R. I., are not being worked. The machinery and material at the latter plant are being shipped to Newcastle, where it is expected to arrive about Jan. 1.

ENTERS ACCESSORY FIELD.

Motometer Company Organized in New York to Produce Novel Heat Indicating Device.

The Motometer Company, Inc., 1784 Broadway, New York City, recently organized, is one of the latest entrants in the automobile accessory manufacturing field. George Townsend, 2d., formerly an amateur racing driver well known in automobile circles, is president and treasurer and Harrison Boyce is secretary. The company will market a new device invented and patented by Mr. Boyce and known as the motometer. It is an instrument which by an ingeniously arranged dial tells the driver at all times the exact heat of his motor and warns instantly when overheating is about to take place.

Mr. Townsend, together with Caleb Bragg, organized the first Yale hill climb at New Haven, Conn., some years ago and together they became well known amateur drivers, racing at numerous meets. Townsend ceased racing prior to Bragg's turning professional. Mr. Boyce has a reputation as an inventor of marked ability. He invented the first demountable rim upon which a patent was granted in this country. It was used on the Locomobile racer in the 1905 Vanderbilt Cup race. He conceived a leather non-skid tire and formed the Healy Leather Tire Company and later he invented the Sireno horn and has been connected with the company manufacturing it for some time.

TONE HEADS NEW COMPANY.

Another Car to Locate in the Middle West, Probably at Indianapolis.

Although not yet ready to make a public announcement, it is understood that another Indiana motor car manufacturing concern is about ready to enter the field with a medium priced machine which will bear the name of Tone. The company is to be known as the Tone Car Corporation and will be headed by Fred I. Tone of Indianapolis. It is expected that the factory will be located in that city.

Mr. Tone became connected with the automobile industry in 1896, starting with the Locomobile Company of America, now at Bridgeport, Conn. Later he was engineer with the Marion company in Indianapolis. In 1905 he was instrumental in creating a radical departure from conventional lines by producing the American underslung design. For the past two years he has been general engineer for the Willys-Overland Company, Toledo, O.

It is understood that the Tone Corporation will built but one style of chassis, with a choice of standard bodies, including roadster, touring, coupe and light delivery. The complete car will be constructed in the factory of the company.

WITH STEINBOCK CONCERN.

Gormully Resigns as General Purchasing Agent of United States Motor Company.

A. R. Gormully, for four years purchasing agent for the Maxwell-Briscoe Motor Company, Tarrytown, N. Y., and since its formation general purchasing agent for the United States Motor Company, has resigned to become treasurer of the Steinbock Engineering Company, New York City, maker of engines for automobiles, motor boats, aeroplanes, etc. He expects to reconnect more directly with the motor car industry in the near future, however.

A. R. Gormully, Treasurer, Steinbock Engineering Company.

Mr. Gormully was born and educated in London, England, and came to Boston in May, 1892. He began active business life with the Gormully & Jeffrey Manufacturing Company, Chicago, as an office boy, and arose to become manager of the export department before leaving this concern in 1900. The next two years were spent with the Electric Vehicle Company in its first plant in New York City as superintendent's assistant. From 1902 to 1904 he was assistant manager of the Erie Basin Works, maker of general machinery, and in 1905 he went with the Vehicle Equipment Company, Long Island City, as purchasing agent. His connection with the Maxwell and United States Motor companies followed.

ADDS ANOTHER NEW PLANT.

Willard Storage Battery Company Now Has Four Separate and Distinct Factories.

The Willard Storage Battery Company, Cleveland, O., maker of LBA batteries, recently purchased property adjoining its plant No. 1, affording 50,000 feet of additional manufacturing space. Since that time the company also has acquired the plant adjoining this, a building of brick and steel construction with 32,500 feet of floor space.

This will furnish the Willard Storage Battery Company with four separate and distinct plants, all conveniently located close together, but not connected. Three are individually equipped for the manufacture of storage batteries and the most recent purchase is intended for future expansion. It will be used for storage purposes only, for the present, or until such time as the rapidly increasing business warrants other plans.

NEEDS MORE ROOM.

Myers Becomes Swinehart's General Manager and Concern Will Build New Plant.

Clifford B. Myers has been chosen general manager of the Swinehart Tire & Rubber Company, Akron, O., maker of Swinehart tires, to succeed W. W. Wuchter, president of the company, who has for some time acted as general manager. The change is an initial move towards enlarging the plant and expanding the business generally.

According to the present plans it is probable that in the near future the company will build a much larger factory than it now occupies. The site has not been selected, but as the present plant is in the heart of the city with no vacant space in proximity, property probably will be purchased in the suburbs and eventually the old building will be sold.

RECEIVER IS APPOINTED.

Creditors for the Flanders Manufacturing Company Consent to This Plan.

Owing to the refusal of certain creditors to act with the committee which assumed charge of the affairs of the Flanders Manufacturing Company, Pontiac, Mich., maker of Flanders electrics, etc., a few weeks ago, the Detroit Trust Company was named as receiver by Judge Tuttle of the United States district court, bond being fixed at $50,000. The dissatisfied creditors attempted to have the firm declared bankrupt, but the directors prevailed upon them to consent to the receivership.

It was pointed out that the assets of the company were greatly excess of the liabilities and that the difficulties were merely through a lack of ready working capital. A statement has been sent out by the creditors' committee that the company will be operated until such time as an inventory can be made, when it will be definitely decided whether to liquidate or continue operations. The business will be continued if the refinancing and production plans are agreeable to the receivers, it is stated.

A KEROSENE DRIVEN CAR.

Arthur Mason Said to Be Engaged in Designing Machine to Use No Gasoline.

It is understood that Arthur C. Mason is designing a car to be produced by the Republic Motor Company, Flint, Mich., which will use kerosene exclusively. This statement is taken to mean the motor will be supplied with kerosene only, since Mr. Mason is quoted as saying that it was possible to do away with the use of gasoline even for starting purposes.

The Republic Motor Company was organized recently to include among its constituents the Little Motor Car Company and Chevrolet Motor Company, and it is anticipated that one of these concerns will undertake the manufacture of the new car. Further announcement will be awaited with interest.

TO MANUFACTURE CROCE TRUCK.

Company Organized in Asbury Park, N. J., Will Manufacture Two Chassis Models.

The Croce Automobile Company, Asbury Park, N. J., has been incorporated with capital of $250,000, of which $50,000 is paid in, for the purpose of manufacturing the Croce truck. The incorporators are Louis P. Croce, designer of the new vehicle; T. Frank Appleby, formerly mayor of the city, and Harry A. Watson. Others interested in the company are Henry C. Winsor, Col. John W. Aymer, Stuart Appleby, Theodore Appleby, Richard W. Herbert, Samuel A. Reeves, Charles R. Zacharias, Charles Rugerber, Albert Robbins, E. W. Krymer and J. Voorhees Krymer.

The first story of a handsome two-story steel and brick factory building at First and Railroad avenues has been completed and it is expected that the second will be ready in February. It will contain 8000 square feet of glass, indicating that plenty of light will be a feature of the construction. The first floor will be devoted to chassis work and the second to the production of bodies. Two models will be made, one of 1500 pounds and the other of two tons. One of the former has been placed with Vogel Bros. Company of Asbury and one of the latter with the Wesley Engine & Hose Company of that city

GENERAL MOTORS' NEW HEAD.

Life History of the Man Who Will Direct the Destinies of Big Factory Group.

Charles W. Nash, who has succeeded Thomas Neal as president of the General Motors Company, Detroit, one of the largest, if not the largest, group of motor car producing factories in the world, was born near Dekalb, Ill., Jan. 28, 1864. At the age of seven, his parents having moved to Michigan in the meantime, he was bound out to a farmer in Flushing. By the terms of the agreement he was to receive a suit of clothes each year and to go to school three months in every 12. At the age of 21 he was to get two suits of clothes, both at the same time, and $200 in cash.

But the lad did not like farming, apparently, for he ran away at the end of the fourth year of service. At the age of 11, therefore, he began to learn the carpenter's trade with a salary of $7 a month. Later he secured a raise of $1 a month. At 18 he became a hay presser and at 21 he went back to farming, staying at it for seven years this time.

In the meantime he was married, and as Mrs. Nash's health was not good they moved to Flint, where he became a clerk in a grocery store. Not long afterward J. Dallas Dort of Flint wanted some plums picked and young Nash applied for the job. He picked plums so well that Mr. Dort gave him a job in the trimming department of the Flint Road Cart Company, then a small but thriving concern, which in later years developed into the Durant-Dort Carriage Company.

Charles W. Nash, President, General Motors Company.

At the end of six months he was made superintendent. It was a comparatively few years before he was vice president and director. In the fall of 1910 he was called to the general management of the Buick Motor Company of Flint, and under his leadership the company has increased its earning power with a rapidity which has surprised the industry. His selection to head the General Motors group, of which the Buick is but one of the constituents, is considered by his many friends throughout the country as a suitable recognition of true merit.

It may be permissible to add a word concerning Mr. Nash's personality. Back in the days when he knew his "boys" by daily contact with them, he took the time to inquire about the wife and baby and how things were going in the home. When he found the wolf showing his fangs he would call the man into his office and ask all about it. In the end perhaps it would mean a small loan without interest, or a big loan, without interest, or the purchase of a house and lot to be paid for on the installment plan, also without interest. And it was years before anyone knew of the things he was doing. This is the first time anything about it has been published.

NEW REPUBLIC RUBBER OFFICERS.

Board of Directors Fills Vacancies and Considers Other Details of Management.

At the directors' meeting of the Republic Rubber Company, Youngstown, O., the following officers were elected: First vice president, L. T. Peterson, to succeed L. J. Lomasney, deceased; second vice president and director, succeeding L. T. Peterson as second vice president, John H. Kelly; director to fill remaining vacancy on the board, A. H. Harris.

In addition to his work as general sales manager, Mr. Kelly, as second vice president, will co-operate with the president and other officers in the general matters of management.

PRODUCING FEPS CARBURETOR.

Something About the Men Who Comprise the Schoen-Jackson Company.

The announcement of the Feps carburetor, which was described in detail in a recent issue of The Automobile Journal, has served to bring the Schoen-Jackson Company, Media, Penn., into prominence in the motor car industry. The concern is composed of Charles T. Schoen and M. R. Jackson, two men who have had wide manufacturing experience.

Members of Schoen-Jackson Company: At Right, C. T. Schoen; at Left, M. R. Jackson.

Mr. Schoen is well known as the inventor of pressed steel cars and pressed and rolled steel wheels, for which over $7,000,000 have been paid by the railroads of the country. Since disposing of this business to the United States Steel Corporation he has been engaged in the manufacture of flexible metallic tubing. Mr. Jackson has been associated with Mr. Schoen in a business way for the past eight years. Upon him is devolved most of the active management in connection with the production of the tubing.

Some 20 years ago Mr. Schoen devoted considerable thought to the subject of carburetion and took out several patents on successful carburetors. Recently, J. L. Fritz, the young man who invented the Feps vaporizer, called Mr. Schoen's attention to his device and the latter was immediately impressed by its construction and design. The skilled mechanics of the Schoen-Jackson Company were invited to prepare the production for the market, and after more than 100 road and dynamometer tests the Feps carburetor made its appearance in public. That the company is convinced that the new vaporizer will meet the requirements of the motor car industry, particularly with reference to the use of low grades of gasoline, is borne out by the fact that a new plant, entirely apart from the tubing factory, has been constructed for its manufacture.

SOLVING CAR SHORTAGE PROBLEM.

Service Bureau of National Association of Automobile Manufacturers Adopts Trial Plan.

The service bureau which the National Association of Automobile Manufacturers at its last meeting voted to establish at Detroit, Mich., the heart of the automobile industry, has been installed and already a comprehensive system is being arranged to improve the railroad traffic in motor cars. It is thought that the new system will give the automobile manufacturers many more freight cars during the shipping season than has been the case heretofore and thus the car shortage will be greatly minimized.

When a shipment is made the numbers of the cars are taken and forwarded to the railroad officials who will make delivery of the freight, with a request that the cars be protected and returned as soon as possible to the railroad which made the original shipment. A system of daily reports has been arranged to show the location of the various cars en route. A large percentage of the delays is occasioned by the demurrage rules, but the service bureau hopes to improve largely the present service by its new system.

PEERLESS TO INCREASE CAPITAL.

Stockholders Meeting Called to Act on Proposition to Add $7,000,000 to Present Stock.

Stockholders of the Peerless Motor Car Company, Cleveland, O., maker of Peerless trucks and pleasure cars, will be asked at a special meeting Dec. 20, to consider and vote upon the proposition to increase the capital of the company from $3,000,000, its present authorized stock, to $10,000,000.

This is to be divided, according to the plans, into 100,000 shares of $100 each, of which issue 50,000 shares shall be disposed of as preferred stock and the remainder as common stock, subject to the usual restrictions. The stockholders also will vote upon the matter of authorizing the directors to dispose of the increased stock and also upon a proposal to amend the code of regulations of the company.

ENOS SUCCEEDS HOOPER.

Buffalo Man Selected to Head American Automobile Association—Annual Reports.

A balance of $3293 in the treasury, all bills paid and the good roads movement making satisfactory progress throughout the country as a result of the efforts of the organization were the features brought out at the annual meeting of the American Automobile Association, held at Chicago, Dec. 2-3. Robert P. Hooper retired as president, as previously announced, and Laurens Enos of Buffalo, N. Y., was elected as his successor.

There was shown to have been a deficit in the contest department when William Schimpf became chairman of the contest board, but he was able to pay all bills and show a small surplus in the bank. The board granted 132 sanctions. Twenty more tracks were licensed than ever before and 94 meets were held during 1912 as against 52 in 1911 and 72 in 1910. The board took in $13,225 in sanction fees; $100 for stock car certificates; $1140 for drivers' fees; and $320 for track licenses. The expenses of the board for the season amounted to $8170.

The new officers elected follow: President, Laurens Enos, Buffalo; first vice president, John A. Wilson, Pennsylvania; second vice president, Dr. H. M. Rowe, Maryland; third vice president, R. W. Smith, Colorado; fourth vice president, F. L. Baker, California; fifth vice president, Asa Maine, Minnesota; secretary, J. N. Brooks, Connecticut; treasurer, H. A. Bonnell, New Jersey; chairman of executive committee, A. G. Batchelder, New York. It was decided to open a branch headquarters at Washington, D. C., and the next annual meeting will be held at Richmond, Va.

President Enos, at the first meeting of the new executive committee, announced the reappointment of the following chairmen: Contest committee, William Schimpf; good roads, George C. Diehl; touring, Howard Longstreth; legislative, Charles T. Terry.

FEDERAL DECLARES STOCK DIVIDEND.

Exclusive Manufacturer of One-Ton Vehicles Meets with Splendid Success.

The Federal Motor Truck Company, Detroit, maker of Federal trucks, has declared a stock dividend of $100,000 and a 10 per cent. cash dividend, according to an announcement recently made by General Manager Martin L. Pulcher. The company was incorporated only three years ago with capital of $100,000, and during that time the output of trucks has steadily increased. The first year 50 commercial vehicles were manufactured, while 135 were made the second and 750 the third. The output for 1913 is scheduled as 1500 trucks, but this may be greatly increased.

The company has been forced to move three times to care for increasing business and it now occupies the large and modern factory originally constructed for the Van Dyke Motor Car Company. Additions doubling the plant's capacity are planned for the near future. T. E. Reeder is president of the company; Edwin Denby is vice president, and Martin L. Pulcher, to whom is ascribed a large part of the concern's success, is general manager.

WESTINGHOUSE IN ACCESSORY FIELD.

Will Open New Plant Giving Employment to 400 Additional Workmen.

The Westinghouse Electric & Manufacturing Company, Pittsburg, Penn., is adding to its production of automobile accessories and will soon open a new plant for this purpose, which will employ 400 workmen. The outlook for the accessory product is said to be brighter now than at any time in the past.

The first floor of the former warehouse of the Bindley Hardware Company, at Shadyside, Pittsburg, has been taken over by the Westinghouse interests and the machinery has been installed. The plant will be in operation in a few weeks. Two hundred men and a like number of women will be employed at the start.

MILLIONS FOR FACTORY EXTENSION.

United States Tire Company Planning to Expend Large Sums During 1913.

The United States Tire Company, New York City, which operates four big plants, announces arrangements for an expenditure of $3,000,000 in factory improvements and extensions during 1913. The Morgan & Wright plant in Detroit, which it owns, is to be doubled in both area and production. Ground has been broken for several new buildings and work will be rushed forward as rapidly as possible. Its employees, now numbering 2500, will be increased to 6000 when the improvements are finished. The output of the factory will be in excess of 5000 tires daily.

It is planned to erect 16 new factory buildings ranging in size from 2000 to 131,000 square feet. Among these will be a finely appointed laboratory, where the scientific experimental work will be carried on, several warehouses and at least a half dozen manufacturing buildings, the largest of which will be 230 by 60 feet and six stories high. A new power plant will also be installed, doubling the boiler capacity of the factory.

The United States Tire Company operates extensive rubber works in Indianapolis, Ind., Hartford, Conn., and Providence, R. I., and is increasing the facilities of all these plants to provide for the tremendous growth of the tire industry. At Indianapolis a building 80 by 170 feet and six stories high is being erected; at Providence another structure 75 by 300 feet and three stories high will be added, while at Hartford a fine new power house and power plant have been installed at a cost of more than $175,000.

WILL MAKE MOORE TRUCK.

Syracuse Concern Increases Capital and Purchases Building for Manufacturing Purposes.

The Palmer-Moore Company, Syracuse, N. Y., has increased its capital stock from $100,000 to $200,000 and will at once begin the manufacture of motor trucks in the plant of the Syracuse Stove Works in North Geddes street, which has been purchased by this concern. The following are the officers: President, T. G. Meachem; vice president, T. W. Meachem; treasurer, Charles L. Palmer.

For about two years the company has been experimenting with a two-cycle motor patented by Edward Moore and the perfected motor will be embodied in the new truck, which will be known as the Moore. It will be air-cooled in the lighter type of vehicle and water-cooled in the heavy type. The plant has been appraised at $76,000, covers 3.5 acres of land and is well located.

NAME CHANGED TO PALMER.

R. A. Palmer Becomes General Manager of the Reorganized Suburban Motor Car Company.

Randall A. Palmer, formerly organizer and general manager of the Cartercar Company, Pontiac, Mich., maker of Cartercars, has become vice president and general manager of the Palmer Motor Car Company, which is the new name of the Suburban Motor Car Company of Detroit, Mich. The plant which was being built for the Suburban company at Ecorse is partly completed and it is hoped to have the work finished by the first of the year so that manufacturing operations can be begun by the Palmer company.

Mr. Palmer will have entire charge of the engineering and manufacturing departments. He is also president of the Palmer-Bee Company, dealer in power transmission and power machinery. W. A. DeSchaum, who designed the Suburban car, will not be connected with the reorganized company. The plant has a frontage of 353 feet on the main lines of all the railroads entering Detroit from the South, and enjoys unexcelled shipping facilities.

RAYMOND CAR COMING.

Company Secures Factory Facilities at Hudson, Mass., and Will Begin Manufacture.

The Raymond Engineering Company, incorporated under the laws of Massachusetts in 1911, to manufacture, develop and deal in gasoline engines for marine, automobile, motor truck and stationary purposes; light, low-priced automobiles and delivery wagons, has occupied a large factory building at Lincoln park, Hudson, Mass. The firm has capital of $150,000 and H. M. Warner is to be superintendent of the factory operations.

A. B. Raymond, M. E., a graduate of Cornell University, and vice president of the firm of Swasey, Raymond & Page, is president of the concern and the board of directors include Mr. Raymond, E. V. Henderson and J. L. Donovan of Boston. Previous to his connection with Swasey, Raymond & Page, Mr. Raymond was in charge of the calculating department of the Wm. Cramp Ship & Engine Building Company of Philadelphia. The knowledge gained in this experience resulted in the development of the "R-V" motor, now built in sizes from 10 to 160 horsepower; the Raymond runabout, a 100-inch wheelbase pleasure car of 25 horsepower, and the Raymond roadster.

SCHEBLER RETIRES FROM FIRM.

Sells His Interest in Wheeler & Schebler Because of Continued Ill Health.

Announcement has been made that George M. Schebler, inventor of the Schebler carburetor and member of the firm of Wheeler & Schebler, Indianapolis, Ind., has retired from business on account of ill health. The news will come as a surprise to many, but to Mr. Schebler's friends it had been known for some time that he intended to close out his business interests.

Mr. Schebler was one of the first men in America to devote his time to the construction of a carburetor for gasoline engines. At that time he had a small shop for experimental purposes, which has since grown into the largest plant of its kind in the United States. For the past several years Mr. Schebler's health has been failing and his retirement comes only after the most mandatory advices of his physicians. By the retirement of Mr. Schebler, F. H. Wheeler will become the sole owner of the plant, having purchased Mr. Schebler's interest. He states that the firm name will not be changed.

LENOX IN NEW FACTORY.

Plans Under Way for Still Another Addition to Accommodate Rapidly Growing Business.

The Lenox Motor Car Company, Hyde Park, Mass., maker of Lenox cars, has moved into its new factory, recently completed. The company now has 30,000 square feet of floor space in addition to office rooms. Despite the fact that the company has been operating only three years the demand for Lenox cars has been so great that the first plant at Jamaica Plain was speedily outgrown, necessitating more room.

Even the new plant is not sufficient to carry on the business and plans have been drawn for another new factory building adjoining it, to be four stories high and having 120,000 square feet of floor space. Work will be begun upon this immediately and it is hoped to have it in operation early next year.

DURANT HEADS CHEVROLET.

Plans Being Made to Perfect Organization to Take Care of Increased Demand for Product.

The board of directors of the Chevrolet Motor Company, Flint, Mich., maker of Chevrolet cars, has elected W. C. Durant president and J. Dallas Dort vice president of the concern. W. H. Little was chosen second vice president; Dr. E. R. Campbell, treasurer; Curtis R. Hathaway, secretary; F. A. Aldrich, assistant treasurer, and W. W. Murphy, assistant secretary.

It was announced that the company would take over the factory buildings of the Imperial Wheel Works, but it now appears that this will not be done for several months, as the Imperial company is still utilizing the buildings. However, a part of the plant, now being made ready, will be used by the Chevrolet company and plans are going forward to perfect an organization capable of caring for the output when manufacturing begins on a large scale.

RECEIVER TO SELL ASSETS.

Griswold, Ellis & Dickinson Secures Property of Wyckoff, Church & Partridge for $150,000.

The creditors of the bankrupt firm of Wyckoff, Church & Partridge, Inc., New York City, maker of Guy Vaughn cars and Commer trucks, at a recent meeting accepted the offer of Chester Griswold, George A. Ellis and Howard C. Dickinson of the firm of Griswold, Ellis & Dickinson, of $150,000 for the assets of the company, and John S. Sheppard, Jr., the receiver, was given the power to transfer the property at that figure.

The appraised value of the assets is $171,000, but in addition to the $150,000, the receiver has about $40,000 in cash on hand. There are about 800 creditors and the known unsecured claims amount to about $575,000, not including unliquidated or contingent claims. The terms of the sale are said to provide for payments of $50,000 in four, eight and 12 months respectively.

THE NEW YORK SHOW.

Exhibit of Machine Tools Will Be an Important Added Feature This Year.

A machine tool exhibit will be an added feature at the 13th national automobile show in Madison Square Garden and Grand Central Palace, New York City, Jan. 11-25, this having particular reference to the second portion, or that beginning Jan. 20, when the commercial vehicles will be the centre of attraction. This decision was reached last week after a conference between Secretary Merle L. Downs of the Automobile Board of Trade's show committee, and President Bullard of National Tool Builders' Association.

That this is to be an accessory year is now pretty generally known and appreciated, but it is learned that a large number of makers are reserving new products of this nature for their initial appearance at the show. The list of exhibitors indicates that there will be no less than 530 separate concerns represented, of which 43 makers of pleasure cars and 272 accessory firms will display their wares the first week, and 25 truck manufacturers will exhibit the second week in the Garden. At the Palace, 46 pleasure car makers, 25 motorcycle concerns and more than 100 accessory firms will be seen the first week, and at least 41 truck producers the second. The vehicles will be divided as follows:

Madison Square Garden, First Week.

Alco, Auburn, Buick, Cadillac, Cartercar, Chalmers, Columbia, Cunningham, Stoddard-Dayton, Flanders, Franklin, Garford, Haynes, Hudson, Jackson, Knox, Locomobile, Lozier, Matheson, Maxwell, Mercer, Mitchell, Moline, Moon, National, Marmon, Oakland, Oldsmobile, Packard, Peerless, Pierce-Arrow, Pope-Hartford, Premier, Pullman, Reo, Selden, S. G. V., Stearns, Stevens-Duryea, Warren, White, Overland and Winton.

Madison Square Garden, Second Week.

Alco, Autocar, Buick, Federal, Garford, G. M. C., Gramm, Hewitt, Hupmobile, Kelly-Springfield, KisselKar, Knox, Locomobile, Mack, Packard, Peerless, Pierce-Arrow, Pope-Hartford, Reo, Saurer, Selden, Speedwell, Velie, Walter and White.

Grand Central Palace, First Week.

Abbott, American, Atlas, Bergdoll, Briggs-Detroiter, Buffalo, electric, Church-Field electric, Cole, Firestone-Columbus, Cutting, Davis, Edwards-Knight, Empire, Fiat, Havers, Henderson, Herreshoff, Hupmobile. Stutz, Imperial, Inter-State, Rambler, KisselKar, K-R-I-T, Lenox, Marathon, Marion, Metz, Michigan, Pathfinder, Norwalk, Only Car, Paige, Paterson, Case, R-C-H, Regal, Speedwell, Standard electric, Studebaker, Velie, Westcott and Republic.

Grand Central Palace, Motorcycles, First Week.

Eagle, M-M, Thor, Yale, Emblem, Excelsior, Flanders, Greyhound, Harley-Davidson, Indian, Henderson, Flying Merkel, Minneapolis, New Era, Pierce, Pope, R-S, Schickel and Triumph.

Grand Central Palace, Second Week.

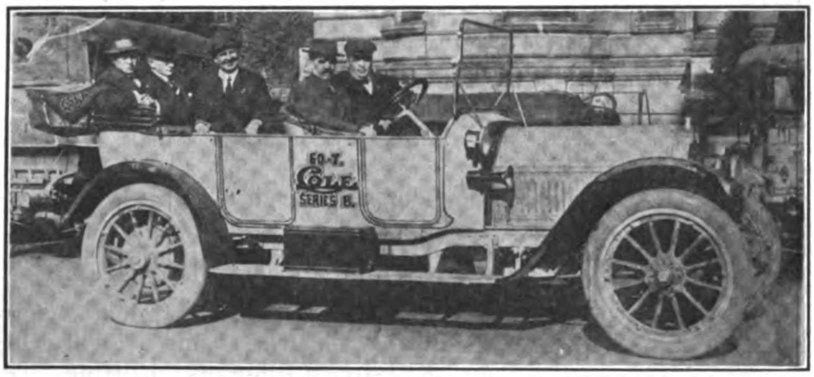
Atlantic, Atterbury, Baker, Bessemer, Blair, Modern, Brown, Buffalo, Chase, Dart, Durant-Dort, G. M. C., General Vehicle, Gramm-Bernstein, Grand Rapids, La France, Koehler, Lansden, Lauth-Juergens, Lippard-Stewart, Mais, Mercury, M. & P., Randolph, Rowe, Sanford, Schacht, Service, A. O. Smith, Standard, Stegeman, Sternberg, International, Stewart, Studebaker, Sullivan, Universal, Ward, Waverley, Webb, Maccarr and Kreb.

TAKES OVER OLIVER TRUCK.

New Concern Formed in Detroit to Continue the Manufacture of This Line.

The Oliver Motor Truck Company was recently organized at Detroit and has purchased all material, blue prints, patterns, jigs and dies, together with patents and all future rights of manufacture of Oliver cars from the receiver of the Oliver Motor Car Company, Detroit. Gus A. Meyer is president and general manager, while Fred J. Meyer is treasurer of the new company. Both are Detroit business men. The organization of the sales department is being intrusted to Ray F. Beach, who was formerly connected with the sales department of the Oliver Motor Car Company.

It is the intention of the Oliver Motor Truck Company to continue the manufacture of the Oliver 1500-pound light delivery wagon and the 3000-pound Oliver truck, with a few changes in the nature of improvements. The company will be located at 460 Lawton avenue, Detroit. It is said that the first cars will be ready for shipment in about 30 days. Mr. Beach recently returned from a trip through Missouri and Nebraska and reports a large demand for light delivery cars and trucks in that section.



President J. J. Cole at the Wheel of the Latest Six-Cylinder, 60 Horsepower Cole Model.

MILLER'S ADVANCE CATALOGUE.

Well Known Accessory Concern Preparing Annual List.

Each year Chas. E. Miller, 97-103 Reade street, New York City, the pioneer jobber, manufacturer, exporter and importer of automobile accessories, prepares 100,000 copies of his annual advance catalogue for use at the shows in the various cities in which he has branches. These include 15 stores in nine different states, and the first show at which the 1913 volume was seen was at Atlanta, Ga., Nov. 16-23. Several copies will be reserved for more general distribution.

Following the example of other years the cover design includes suggestions of motoring, motorcycling, motor boating and aeroplaning, signifying that "Try Miller" is an axiom which applies to each of these fields. Another Miller slogan is presented in: "We either carry in stock, will get it—or it isn't made." The list of accessories and supplies represented in the book is much too large to permit of detailed mention. An attempt would prove little short of cataloguing the entire accessory business, at least that portion which has come to be standardized by consistent advertising. The enviable position occupied by this house since its establishment in the early days of the automobile industry, almost before there was any demand for accessories and supplies, enables it to produce a work of this nature which is particularly valuable as a reference book in buying standard articles.

STEAL MARCH ON PRESIDENT COLE.

Incident Serves to Illustrate How Well Cole Sales Force Watches the Factory.

For over two years President J. J. Cole of the Cole Motor Car Company had been hiding the secret that he was to produce a six-cylinder model. The Cole sales department, although it keeps in the closest touch with the factory, had been unable to get more than a confirmation of the rumor.

Recently Mr. Cole, off his guard for a moment, drove down to the Columbia Club in Indianapolis, in his new six-cylinder, 60 horsepower Cole. Two days later he received a telegram from W. S. Gotshall of St. Louis, as follows: "Coming in private car with 20 to see Cole 60." The next day similar telegrams were received from New York, Boston, Cleveland, Louisville, Chicago and Newark. President Cole said:

"Well, they stole a march on me this time, but I am thoroughly satisfied with the 60. I believe that the automobile industry has a future and so there is more and more perfection waiting for us over the hill. But this series eight comprises the best cars I have ever built.

"I will have to wait until many months of correspondence comes in before the public can improve on it. I say the public because automobile owners have built this car. My distributors send me everything they hear about automobiles. Our mail is carefully scrutinized in order to find out what the public needs. That is why I do not blame the distributors in the field for stealing a march on me. They beat me by one day."

TO PRODUCE NEW TRUCK.

Leo Gillig of San Francisco Enters This Field on the Pacific Coast.

Leo Gillig, who has been connected with the motor car trade at San Francisco, Cal., for a number of years, has entered the manufacturing field and has turned out the first Gillig truck from his plant at San Francisco. The vehicle has 1500 pounds capacity and shows some new and decidedly interesting features. Mr. Gillig has contracted to place 50 of his trucks on the market for the 1913 season.

The new light delivery wagon has chain drive with patented differential of the most simple design. Either solid or pneumatic tires can be used and the bodies are built to suit the convenience of the purchaser. The truck has left hand drive and is durable in construction. It will be marketed at a popular price, and is expected to meet a long felt want in its particular field.

NEBRASKA'S GOOD ROADS BILL.

State Automobile Association Prepares Legislation Creating Highway Commission.

At the recent convention of the Nebraska State Automobile Association a bill was prepared for introduction into the legislature, creating a state highway commission, the members of which shall receive no compensation, except their actual expenses. The commission will have power to employ a competent engineer, who will work under its direction, and sufficient clerical assistance.

Among the proposed duties of the commission will be that of investigating and carrying on experimental work in road and bridge building, different methods of construction, kinds of material and the various methods of drainage which will be best adapted to the soil of the separate sections of the state.

THE MODERN SALES FORCE.

Weinstock-Nichols Company in Favor of Reform in Salesmanship.

An idea which will bear passing along to other concerns in the industry comes from the Weinstock-Nichols Company, San Francisco, Cal., manufacturers' agent and distributor for several well known brands of automobile accessories on the Pacific Coast. It takes the form of a bulletin which was issued recently to the sales force, and it has the title of "The Bar-Room Salesman."

Briefly, the circular sets forth that "Customers can no longer be bribed with champagne and cigars and a good time into buying anything connected with the auto trade." It holds that the customer of today demands two things—good service and good value—and that he has a right to expect of the salesman: That he shall know his business from start to finish, that he shall be able to give intelligent information, that his statements shall be truthful and dependable, that his promises shall be faithfully kept, and that he shall treat the customer as a gentleman would treat him.

"It's a good thing for the customer, the salesman and the trade that the day of the bar-room salesman in the auto accessory trade is a thing of the past," is the final summing up of the document. "Goods must now be sold on their merit and the salesman who hopes to succeed must substitute real knowledge for bluff and good fellowship."

JOINS PHILADELPHIA CONCERN.

J. W. Drown Becomes Sales Manager of the Pressed Steel Manufacturing Company.

The many friends of John Wilson Drown will be glad to learn of his appointment as sales manager of the Pressed Steel Manufacturing Company, Philadelphia, maker of ball bearings. The field is not new to Mr. Drown, since he has been representing ball and roller bearings to the trade for some little time past.

Mr. Drown will be remembered as a former advertising manager of the Corbin Motor Vehicle Corporation, New Britain, Conn., with which concern he was connected for a number of years. Later he accepted the same position with the Standard Roller Bearing Company, Philadelphia. His wide acquaintance in the industry and his thorough knowledge, both of the manufacture of cars and of ball bearings, should make him particularly well fitted for his new position.

ADOPTS TRUFFAULT-HARTFORD.

Well Known Shock Absorbers Become Regular Factory Equipment on National.

Announcement is made that the National cars will be equipped with Truffault-Hartford shock absorbers by the factory in the future, the maker, the National Motor Vehicle Company, Indianapolis, Ind., having closed a contract with the Hartford Suspension Company, Jersey City, N. J., to furnish these devices for all vehicles. This adds still another concern to a long list.

It is maintained by the Hartford Suspension Company that probably no other factor means so much to the car owner as comfort. Truffault-Hartford shock absorbers are held to give ideal riding comfort, and with them it is claimed every road becomes a boulevard.

In order that there may be greater co-operation between the road officials of the several towns and cities throughout the state, the Association of Connecticut Road Officials has been formed in that commonwealth with the following officers: President, W. Scott Eames, director of public works, New Haven; secretary, Charles J. Bennett, superintendent of streets, Hartford; executive committee, Alfred H. Terry, city engineer, Bridgeport; James H. Macdonald, state highway commissioner, Hartford; Robert E. Mitchell, city engineer, Willimantic; Fred L. Ford, city engineer, New Haven, and Charles J. Bennett, Hartford.

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IMPORTANT BAY STATE DECISION.

Justice Braley of the Massachusetts supreme court has written an opinion, in which three other members of the court agree, construing the law of the road as passed in that state in 1820 to compel the driver of an automobile or any other vehicle to pass street cars on the left. The decision was handed down late last month, in the suit of J. Sidney Foster against Thomas P. Curtis, in which the plaintiff sought damages for personal injuries as the result of being struck by the defendant's automobile when alighting from a street car in Broadway, Revere.

With this majority opinion three members of the court, including Chief Justice Rugg, dissented. The majority opinion holds that a street car is a vehicle within the meaning of the law and takes cognizance of the fact that in many places street car tracks are laid at the extreme edge of the highway. It adds: "The requirement, however, is only that the passing vehicle shall 'drive to the left of the middle of the travelled part of the way,' and, as we have pointed out, where the jury finds the circumstances to be such that in the exercise of reasonable care the statute could not be literally obeyed, no inference of negligence can be drawn."

The dissenting opinion holds that to interpret the statute literally would occasion unnecessary traffic congestion. The majority opinion contends that if this be true, it is not possible to disregard the express requirements of the statute and that it is for the legislature to provide a remedy. The minority holds that: "A penal statute cannot be interpreted so that it cannot be obeyed, or so that it will require further legislation to make it workable unless no other course is open. We think it was plain that the legislature did not intend to include electric cars or horse cars within the law of the road."

William A. Thibodeau, attorney for the Automobile Legal Association, has prepared a bill amending the law of the road so as to eliminate street cars from its provisions.

GRADUATED FEES IN INDIANA.

Senator J. J. Netterville of Anderson, Ind., has been looking over the motoring laws in the other states and believes Indiana needs a graduated annual license for automobiles and fees for chauffeurs and manufacturers. At present the only requirement of the Indiana law in this respect is a perpetual registration with the secretary of state at a cost of $1. Senator Netterville expects that his proposed bill will net the commonwealth between $175,000 and $250,000 for good roads.

The proposed schedule of license fees is as follows: Cars of less than 25 horsepower, $5; 25-35, $10; 35-50, $15; over 50, $25; chauffeur, $5 for first two years and $3 a year thereafter; manufacturers, $10. The bill also will contain the following speed provisions: Business districts, 10 miles an hour; residence sections, 12; outlying districts, 15; open country, 25.

AMENDMENTS IN WEST VIRGINIA.

The Ohio Valley Automobile Club, Wheeling, W. Va., is enlisting the support of the state association and the members of the incoming legislature in a proposition to amend the present motoring law. Special attention is being paid to three matters which are considered of the utmost importance—making it unlawful to drive an automobile while intoxicated, prohibiting the throwing of glass and other sharp pointed articles in the roads, and forbidding the use of muffler cut-outs and the making of other unnecessary noises. The provision against intoxicated persons reads as follows:

> No person when intoxicated shall operate a motor vehicle, and any person guilty of so doing shall be subject to a fine of not less than $100 nor more than $300, or imprisonment for not more than one year, or both; and the license of any person guilty of a violation of this section may be suspended for six months by the highway commissioner.

Mechanical Pointers for Garagemen and Repairmen

LINING UP CRANK AND GEARSHAFTS.

If the crankshaft and gearshaft of a motor be suspected of being out of alignment these parts may be tested without dismantling either the engine or the gearbox. If the clutch be of the leather faced cone type it should be examined to note if the cone engages evenly with the flywheel member. If not it may be assumed that the engine and gearbox are not aligned. If on turning the flywheel with the clutch held stationary, the former is inclined to wobble, then the crankshaft is out of line. When the flywheel is held and the clutch revolved the latter shows a tendency to oscillate, then the clutch or gearshaft is out of true. If both shafts be true and the clutch does not engage properly, then the motor or gearbox is out of line.

By attaching a pointer to the clutch coupling so that it will just touch the outside edge of the flywheel, the gear and crankshaft may be tested for alignment without having to dismount the clutch, but if the two shafts require lining up it is advisable to remove the clutch.

When the pointer makes contact with any point of the periphery on the wheel, then the two shafts are in line. If the clutch be removed the pointer may be used on the inside of the wheel. Where fan blades are fitted to the rim of the flywheel this will be necessary. Care should be taken to note if the bushing of the clutchshaft is not worn as this condition will lead one to surmise that the clutch is out of line.

CURING SPRING SQUEAKS.

Occasionally the repairman will be called upon to locate a mysterious squeak or rattle in a car which has puzzled the owner, and an instance of this was noted recently. The motorist complained that the noise was only discernible when the machine was travelling over rough roads and that the rattle seemed to be in the front of the car.

The ball and socket joints of the crossrod and those of the tierod and steering gear were examined but the play in these members was too slight to cause the trouble. Finally one of the workmen began to pull the goose necks up and down, simulating the action of the car in passing over rough roads.

It was discovered that the noise was caused by the side play between the ends of the goose necks and those of the springs, this condition being due to the wear of these parts. When the car was traversing rough roads the axle rarely was parallel with the machine in front elevation, as at one moment the left side was higher than the right and vice versa. This caused the ends of the springs to strike the lugs of the goose necks. The pins were removed and a washer fitted eliminating the noise.

STEERING WHEEL WINDSHIELD.

Although the majority of manufacturers include a windshield as part of the car equipment, there are a number of automobilists whose machines are not fitted with the device and who cannot afford the accessory. A type of windshield, that is not expensive and one that can be made easily, is shown in Fig. 1. It may be made either from glass or celluloid and in size according to the taste of the operator. From 12 to 16 inches will answer the purpose and provide an efficient shield against the wind as well as to protect the driver from foreign elements.

If celluloid be utilized a metal frame will be necessary and this can be made from thin flat or half-round iron. The celluloid is then cut to the shape of the frame and bound with leather. If the device be placed upon the steering wheel it should be made in the form of a half circle. If fastened to the steering column, it can be made round and its method of fastening so constructed as to be adjustable, enabling the operator to raise or lower it at will.

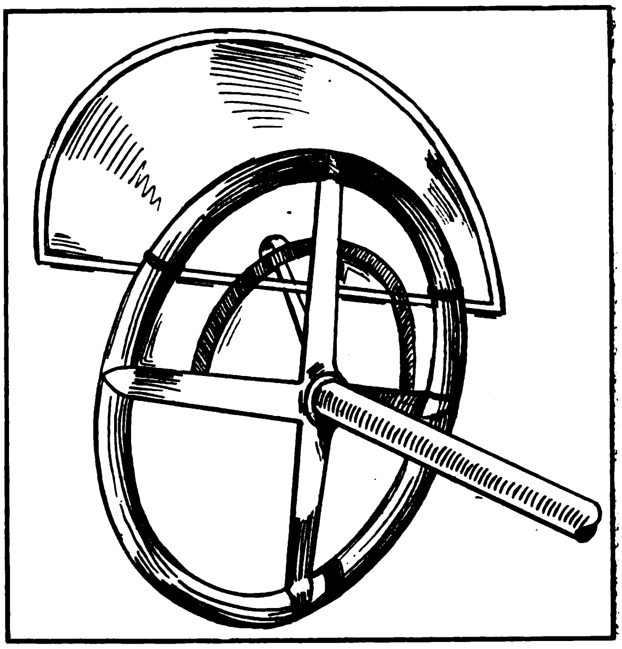


Fig. 1—An Easily Made and Inexpensive Windshield.

CUTTING GEARS.

When cutting gears care must be taken to have the cutter central with the index centres, and to have the cut exactly the depth required. A good method of testing the setting is to cut a groove in a piece on the centres, then shift the piece end for end and try the groove upon the cutter. A good method of holding the gear blanks is on an arbor with a taper shank which fits in the index spindle, the outer end of the arbor being supported by the foot stock centre. Frequently in cutting gears a shank arbor is used with an expanding bushing and a nut at each end of this, one nut forcing the bushing up on the arbor and holding the gear blank, while the other pushes the bushing off the taper and releases the gear when finished.

If the ordinary arbor and dog be used, care must be taken that the dog does not spring the arbor. The depth of the cut can be gauged from the outside of the blank, or if so desired, marked on the side by a gear depth gauge. In cutting gears, when the blank has been placed in position it is raised by the elevating screw until it just touches the cutter. The graduated column on the vertical feed shaft is placed at the zero line and the blank moved horizontally away from the cutter. Then the work is raised the number of thousandths of an inch required for the depth of the tooth.

LATHE APPLIANCES.

There are many special tools which may be utilized with the lathe to facilitate the work of the repairman, especially the small shop where it is customary to send certain pieces outside. The greater part of these could be handled successfully and profitably if the equipment included the necessary special machinery, but much may be accomplished with simple home made tools. Then again, quite a number of old cars being overhauled, frequently require a new part which cannot be secured, requiring a pattern, a casting and subsequent machining.

In the illustrations presented herewith are a number of devices that can be made and will permit of a fairly wide range of work. Those shown at Fig. 2 are of the external type of cutters some of which are superior to the ordinary slide-rest tools, especially the device depicted at A, which may be employed in radius work, such as turning flywheels, hubs, flanges, etc. It is customary to rough out nearly to size and finish with a spring tool. An instrument for centring this as well as other cylindrical work is shown at F.

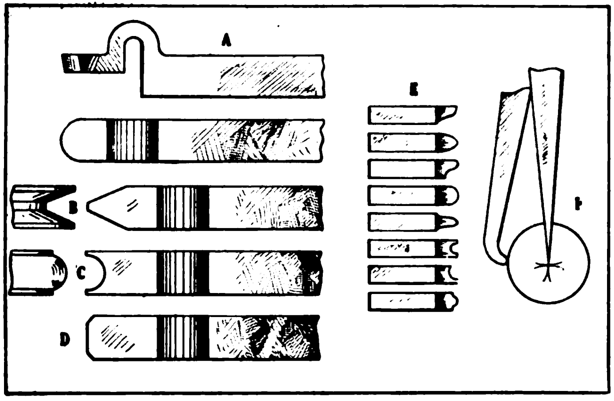


Fig. 2—Handy Lathe Devices: A, Spring Tool for Radius Work; B, Implement for Finishing Small Pulley; C, Device for Bead Forming; D, Utilising File for Finishing Iron Castings; E, Small Cutters; F, Instrument for Centring Cylindrical Work.

For turning a groove in a pulley, the tool shown at B will prove handy and it also can be utilized for similar purposes. Where beading is to be done the instrument at C will be useful.

At D is illustrated a tool that will facilitate the facing of a casting. If a cast iron disc, four inches in diameter, and having a cored hole, is to be trued up and polished on one of its sides, it would be bored while in the chuck and then faced up for polishing. The usual method is to finish some castings with hand scrapers, made from worn out flat, smooth files, the teeth of which on both sides have been ground away and the end of the member finished square.

A bar of square iron or steel is clamped in the slide-rest, with one end projecting about four inches, at right angles to the lathe centres, and close to the work to be scraped. The file is securely fitted into its handle, then held with the right hand, the other end resting on the steel bar in the rest. A piece of leather may be placed under the scraper, when in use, to prevent chattering. This tool is presented squarely to the rotating work until a fine surface is obtained after which it can be polished easily with emery cloth and oil. The device can be used in place of a scraper and will accomplish the work much quicker, the lathe being run a trifle faster than for ordinary turning, and by taking a light cut it should leave nearly a polished surface on the work.

The tool shown at Fig. 3 A may be employed for boring in cast or mild steel while the one at B will prove handy in finishing the bore when cast iron is being handled. When machining the latter, if the object has a cored hole, it is a good plan to remove as much of the core sand as possible before trimming out the interior. Sometimes it is a difficult matter to get below the skin of the metal, as it soon takes off the cutting edge. This may be obviated by first facing up the casting; then using a boring tool shaped like that shown at C. The front of this cutter is started into the clean metal on the face of the work, and as it progresses by means of a mechanical or hand feed, it will break away the hard skin of the casting, facilitating the boring operation.

A holder for these is denoted at D. It is made from a piece of .5-inch round cast steel about six inches in length. A hole .25 inch in diameter is drilled through to take the small cutters illustrated at E. These are made of .25-inch round steel and are held in place by a .25-inch set screw. The holder is made from a three-inch piece of .75-inch square mild steel which is drilled through its length and the hole finished with a reamer. A longitudinal saw cut is made to permit it to clamp to the tool-bar in the slide-rest. This piece, when completed, should be case hardened.

The one depicted at F is used for external work and can be a forging. A .3125-inch diameter hole is drilled through at one end and enlarged to .5-inch diameter, to within .125 inch of the bottom. A bolt for holding the tool is shown at G and is made from cast or a mild steel and case hardened. A .3125-inch thread is cut for .75 of an inch. The bolt above the thread is turned to .5-inch diameter and is .375 inch long. The head is .75 inch over all, and 15 teeth are cut around the circumference. A hole .25 inch in diameter is then drilled through its centre, and filed to take the square tools shown at Fig. 2 E. When the bolt is placed its teeth engage with the points filed on the holder, and prevent it from turning when tightening the nut. The combination can be swivelled to any desired angle.

SPEEDS OF CUTTING TOOLS.

To secure the best results from steel used for cutting purposes, attention must be given to the use of calculations in determining the proper speed of the work or tool, according to the conditions. The average machinist in ordinary practise does not make use of these rules but depends on the knowledge acquired through experience and observation. For the benefit of those who are not familiar with rules for finding cutting speeds, and to obviate the necessity of guessing at the proper speed, the approximate cutting speed at which tools or work should be run in the machining of different metals is herewith given:

Cast iron, 14 to 16 circumferential feet a minute.
Malleable iron, 16 to 20 feet a minute.
Steel, 12 to 15 feet a minute.
Brass, 28 to 40 feet a minute.

The circumstances and conditions upon which slight variations of the speeds given depend are numerous, among which are: Whether a rough or finishing, coarse or fine cut, is being taken; the form and shape of the cutting tools; the toughness and density of the metals being worked upon, and the surface machined without regrinding. There is considerable work done in the lathe or planer which requires cutters that project far out of their holders. For such work the cutting rates must be considerably less than above given. Very often the texture of the metal is tough and hard, necessitating slower working and fine feeds in machining.

TEMPERING SPRINGS.

In overhauling a car the repairman sometimes discovers that a spring has lost its elasticity and that a new one should be used. If on a rush job, the member has to be made although spiral springs are to be had in an endless variety of sizes and forms and can be secured readily.

The best steel for making springs that will stand severe use should be a fine grained, tough, mild steel, with just enough carbon in it to harden at a low red heat, hard enough so that a file will just cut it. The temper should be just sufficient to give the proper elasticity, as if too hard the springs will break and if too soft they will set without giving any elasticity.

There are several methods of hardening among which is that of heating carefully and evenly over a forge fire that has burned down, or with a gasoline torch. A clean heat is essential. The metal is heated to a light red, then hardened by plunging in lard oil, or any animal oil.

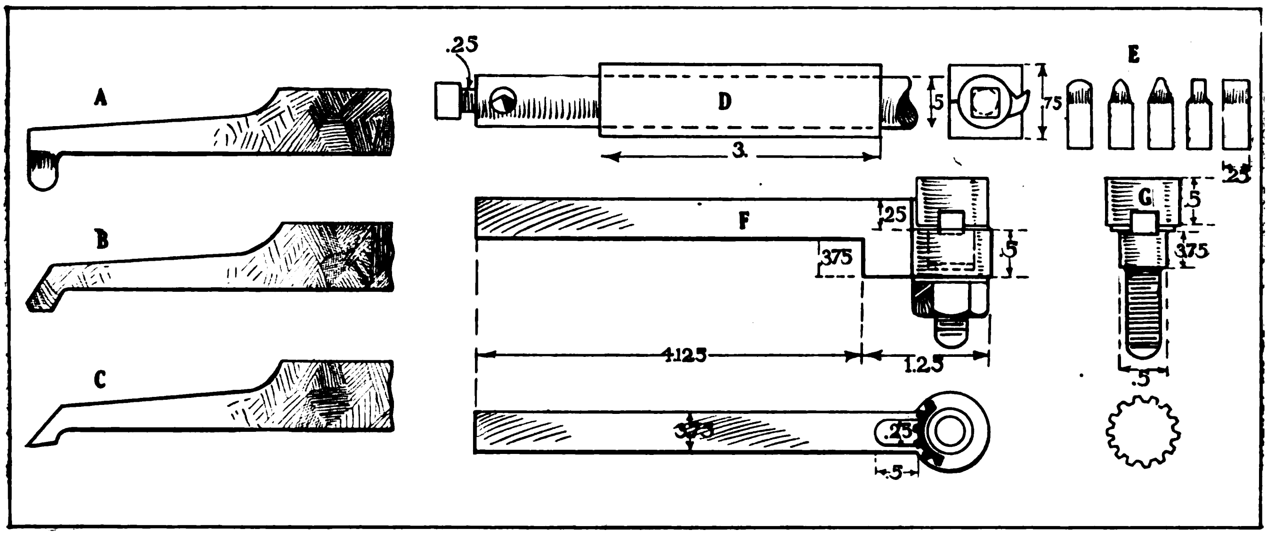


Fig. 3—Handy Home Made Lathe Attachments: A, Internal Boring Tool for Steel; B, Finishing Instrument for Cast Iron; C, Appliance for Roughing Out Castings;D, Internal Tool Holder; E, Small Cutters; F, Tool Holder for External Work; G, Clamping Screw.

Remove from the oil and hold it, dripping with the grease, over a clean fire until this takes fire and blazes off. If a file will not scratch it, it is too hard. Blaze off again until a file will just cut it. The oil should be placed in a receptacle large enough so that the spring can be dipped entirely therein. It is best to temper each spring separately, as no uniformity can be had by tempering a number at the same time, using ordinary methods.

Another way is to heat the spring to a light red, in the shade, and then plunge in water just warm. This is a cheap and easy way and will give the right temper if properly done. A third method, in addition to the above, is after plunging in water, heat again until to a red, not as dark as before, hold it in a dark place, then let cool. Still another way is to heat the spring evenly and cool in raw linseed oil. Then hold the spring over the fire until the oil blazes off. This may be repeated once or twice, as the thicker the spring the more blazing off it will require.

Spiral springs can be tempered by any of the above methods, depending on the quality and kinds of springs to be made. Make a mandrel the size the spring is to be on the inside. A small hole, the size of the wire to be used, is drilled in the mandrel for holding one end of the material. Then wind the wire around the mandrel. It is next taken off and the end in the hole removed either by cutting or pulling out. The spring is then ready for hardening.

If a spiral spring with small ends and large centre, a barrel spring, is required, string a number of washers on an iron rod. Screw them up tightly by means of a nut on either end of the rod. Then place the bolt in the lathe and turn the washers to the required size, winding the spring as above described. The rod may be removed by taking off nut, and the washers can be slipped out between the coils of wire.

UTILIZING OLD FILES.

Files that have lost their cutting edges can be utilized for scrapers and punches. Some repairmen make these tools in preference to using those to be purchased. In making the punch, the file should be annealed by slowly heating to a bright cherry and then buried in air slacked lime to insure slow cooling. The teeth are ground out, although enough may be left at one end for a grip when using the member. One end is then rounded to the shape required and hardened. To temper, heat the punch end to a cherry red and then plunge about two-thirds of it in cold water, moving it to ensure even cooling, and continue until the rest of the tool fails to color. Clean with emery cloth and note colors. They should appear slowly. The tool should be completely quenched when the end is brown.

Broaches handy for removing broken studs and screws may be made from different sized square files. The teeth are ground off after annealing and shaped to the desired size. These should be tempered to a dark blue. Scrapers for bearings can be made from half-round or three-cornered files. The half-round makes the best curved scraper as it can be bent to the required angle. A three-cornered scraper can be made from a file by grinding on a small emery wheel to obtain a concave and the cutting edges ground to a small angle with this face. A scraper for removing carbon may be made from a small mill file. In tempering the files should be heated to a bright cherry and then dipped in water to obtain as hard a temper as possible.

To Waterproof Canvas—Dissolve soft soap in hot water and then add a solution of sulphate of iron, this is washed and dried and mixed with linseed oil. The soap prevents the oil from becoming hard, and water has no effect on it.

CORRESPONDENCE ON MECHANICAL SUBJECTS.

Magnetos and Dynamos.

(121)—Will you kindly explain the difference in the operation and construction of a magneto and dynamo? What is meant by residual magnetism? Also how a permanent and electro-magnet differ? W. E. H.

Holyoke, Mass., Nov. 12.

A dynamo has an electro-magnet which is known as the field magnet to produce the magnetic field, whereas in a magneto this field is produced by means of permanent magnets. The latter are so termed because they are excited by a powerful current and retain their magnetism for a very long time, and to distinguish them from electro-magnets which are excited only so long as a current is passing through wiring coiled around them.

The flat horseshoe magnets sold as toys are permanent magnets and lines of force pass from one end or pole, called the north or positive, to the other, known as the south or negative. If a small piece of iron or steel be brought close to the ends of the magnet or within the zone of magnetic influence, it will be attracted quickly. The magnet, however, will have no influence upon a piece of brass, copper, tin or zinc. This influence radiating from the poles of the magnet is termed the magnetic field.

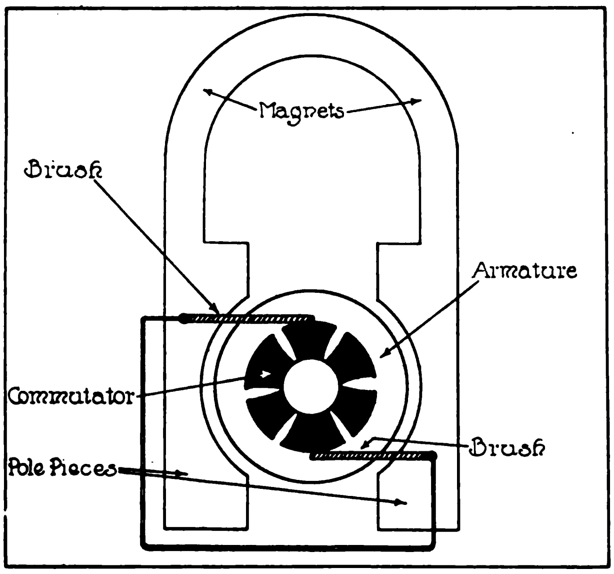


Fig. 1—Illustrating the Components of a Magneto.

If a length of insulated wire be wound into a coil and passed through this magnetic field, a current will be produced in the wire and the magnetic lines of force will be travelling in one general direction on the inside of the coil and in the opposite direction on the outside. In the magneto the coil of wire passes through the magnetic field by rotation, it being wound upon a cylinder or armature as shown at Fig. 1, which depicts a diagram of a magneto. Upon each revolution of the armature the wires become saturated with electricity. Attached to the lower ends of the magnets are the pole pieces and the armature revolves very closely to these members, which increases the magnetic field.

The armature is provided with two deep longitudinal grooves, one diametrically opposed to the other, so that the transverse section looks like a letter H. Insulated copper wire is wound onto the armature lengthwise, so as to lie in these grooves. The wire is short and thick, or long and thin, according to whether a low-tension or high-tension current is desired. As there are two pole pieces, each time the armature makes a revolution the coil member goes through the magnetic field twice and the lines of force are cut by the coil. The intensity of the current varies according to the position of the armature, being strongest where the magnetic pull is the greatest. The direction of the current is reversed each half-revolution as previously explained.

One end of the coil is attached to the end of the iron core which is grounded when attached to a motor car by the metal of the base of the instrument. The other end of the wire coil is insulated by a ring of non-conducting material. The current generated is collected from this ring member by a brush led to a distributing plate, thence to the proper spark plug, and back to the coil by the way of the metal of the car.

The electro-magnets utilized with dynamos are made by placing a bar of soft iron, wrought or cast, within a coil of insulated wire through which a current of electricity is passing. The magnetic lines of force about the wire pass through the iron and convert it into a magnet. When the flow of current is stopped, however, the magnetism almost instantly leaves the iron bar which returns to its original condition. A faint trace of magnetism remains, called residual magnetism, and this is present more or less in all iron or steel. This assists to a certain extent in the operation of the generator. The strength of the electro-magnet depends upon the number of turns in the wire coil and the strength of the current passing through it.

In the lighting dynamo the current generated is usually direct; that is, it flows in one direction all of the time. At Fig. 2 is presented the wiring plan of a dynamo and the components are outlined. It will be noted that the armature rotates upon the longitudinal centre line of its core and carries a large number of coils of wire placed in planes, which pass through the longitudinal centre line of the core, and these coils are so distributed that they cover practically the entire outer surface of it.

At one end of the core is located the commutator, which consists of a number of segments of a cylinder made of copper, insulated from one another and connected, in pairs diametrically opposite, with the ends of the various armature coils. With a bipolar machine, two brushes make contact with the surface of the commutator, one on each pair of segments, forming electrical contacts between the outside circuit and each of the armature coils successively as the armature is rotated.

Assume that the field magnets are already energized when the armature is rotated by belt, chain, gears, etc., and that the magnetic lines of force are flowing across the gap between them and through the armature core from one pole to the other. The movement of the armature coils within this magnetic field sets up an electric current within them, which is collected by the brushes and sent through the outside circuit.

A part of the current, however, is shunted in practise, that is, run from the brushes in the same way as the outside circuit, and is passed through the field windings to energize the electro-magnetic field pieces. Just so long as the armature is kept revolving, so long will an electric current be generated if the exterior circuit be kept closed. The faster the armature is revolved the greater is the amount of current delivered to the field coils, the stronger becomes the magnetic field and greater the output of the generator. When utilized for lighting a motor car a device, either mechanical or electro-mechanical, is incorporated to prevent the high speeds which would tend to burn or fuse the windings.

Dynamos utilized for motor car lighting may be series wound, shunt wound or compound wound.

Timing Renault Motor.

(122)—I have a Renault car which is about eight years old, and would like to secure the timing plan.

W. H. G.

Lawrence Mass., Nov. 11.

The timing plan of the Renault mentioned is not found in the files of the Accessary and Garage Journal. Renault Freres Selling Branch, Inc., 57th street and Broadway, New York City, will doubtless supply the desired information.

Mean Effective Pressures.

(123)—What is the mean effective pressures of standard automobile motors and what is meant by the thermal efficiency of an engine?

STUDENT.

Cambridge. Mass., Nov. 14.

In modern automobile motors the mean effective pressure is about 71 pounds a square inch. This pressure has increased since the beginning of the automobile industry, but in a lesser proportion than the speed. It varies with the size of the motor. Thus, in a current type of motor with cylinders having a 2.4-inch bore and 4.8-inch stroke, it attains about 57 pounds to the square inch. In a motor having a bore of 3.2 inches and stroke of 5.2, it is 71 pounds to the square inch. That of a motor having a bore of 4.4 inches and stroke of 5.6 inches is 85 pounds to the square inch, all other things being equal. This is at 1000 revolutions a minute. The mean effective pressure increases as the result of increased compression. It decreases as the number of revolutions a minute decreases.

The thermal efficiency of a motor, by which is understood the ratio between the work done and the thermal energy contained in the fuel consumed, is about 14 to 15 per cent., corresponding to a fuel consumption of one-eighth of a gallon a horsepower-hour.

The mechanical efficiency, by which is understood the ratio between the work actually done to the energy expended on the piston by the expanding gases, is approximately 70 per cent. The efficiency of transmission or the work done at the wheel rims as compared to that delivered at the crankshaft is generally conceded to be about 75 per cent.

Annealing Boxes.

(124)—Kindly give me the address of concerns making boxes for annealing and case hardening.

REPAIR SHOP.

Hartford, Conn., Nov. 15.

There are several concerns manufacturing the boxes named. Among those listed are: The Wilfong Iron Works Company, Philadelphia; the National Manufacturing Company, Pittsburg, Penn.; Knox Pressed & Welded Steel Company, Pittsburg, Penn.; and the Leetonia Boiler Company, Leetonia, O.

Firing Order of Six-Cylinder Motors.

(125)—What is the firing order of the Pierce-Arrow six-cylinder motor, and do all six-cylinder engines fire alike?

W. E. WHITEHALL.

Washington, Ill., Nov. 11.

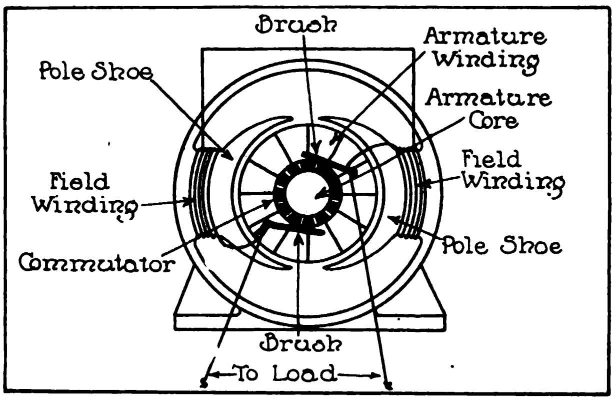


Fig. 2—Showing the Wiring Plan of Components of a Dynamo.

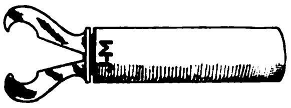
The firing order of the Pierce-Arrow six-cylinder motor is 1-5-3-6-2-4. The firing order is not alike with all motors and it may be arranged 1-3-2-6-4-5, 1-3-5-6-4-2, or 1-4-2-6-3-5, depending upon the design or make. Of 11 leading makes, four fire as does the Pierce-Arrow.

REPAIRING LEAKY METAL FLOATS.

Metal floats ordinarily do not give trouble, but if the walls become punctured through misuse or wear, the mixture will become rich and the exhaust will give off clouds of dense black smoke. If the float be suspected of causing the trouble it may be tested by heating it, then applying a flame, when the leak, if any, will be detected. The aperture should be marked with a pencil, then stopped by a very fine film of solder. This is a delicate task as the balance of the float may be disturbed. After soldering the surplus should be removed with a piece of very fine emery paper, removing as much of the solder as possible.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.



J-M Terminal

The J-M Universal Terminal, marketed by the H. W. Johns-Manville Company, New York City, is designed for attachment to any type of spark plug and may be detached or replaced by the fingers, dispensing with the use of pliers, etc. The device is provided with a pair of elliptic brass jaws which are contracted or expanded as desired by simply turning the fibre sleeve. It is pointed out by the maker that the accidental breaking of the threading device does not incapacitate the terminal as proper contact can be secured through the design of the jaws. The secondary wire is attached easily, the exposed strands being locked by a simple device.

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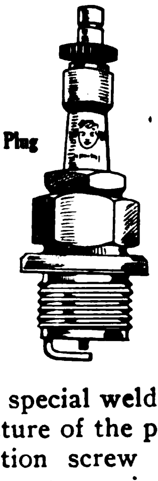

Red Head Magneto Plug

The Red Head Magneto Plug is a new product of the Emil Grossman Company, 250 West 54th street, New York City, and to identify it from the other plugs made by the company the shell and cap are nickel plated. The shell and bushings are similar to the other members and the central electrode has a solid platinum point, .03125 inch thick which is secured by a special welding process. A feature of the plug is the combination screw top and magneto type terminal which will accommodate snap, ring or slip cable connections. The plug comes in a torpedo shaped telescopic box and threads into a cavity in the base of the container, protecting the points and preventing disarrangement of the spark gap.

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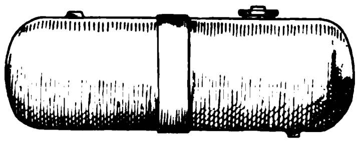
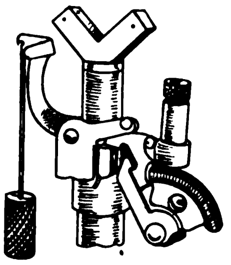


Janney, Steinmetz Tank

Seamless Steel Tanks are favored for the storage of gasoline and compressed air as the construction eliminates the possibility of leaks, making for economy. Janney, Steinmetz & Co., Fourth and Market streets, Philadelphia, manufactures a large variety of steel tanks which are carefully tinned and tested. The company also makes special tanks for containing compressed air for motor starting and tire inflating. A large number of fuel and air tanks are carried in stock.



Alco Lighter

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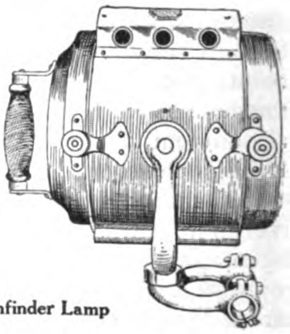
The Alco Lighter is marketed by Chas. E. Miller, 97-103 Reade street, New York City, and is designed for attachment to the base of the acetylene burner. By it the gas may be lighted easily, the operation simply involving the pressing of a lever which moves in contact friction material producing a shower of sparks in the path of the escaping gas. The tip is the well known Alco and throughout the mechanism is sturdily constructed and of high grade material. The sparking material is said to be very durable, may be replaced when worn out and is inexpensive, the same as the device itself.



Pathfinder Lamp

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The Pathfinder Lamp is the product of Bennett & Morse, Columbus, O., and is designed for attachment to the handle bars of the motorcycle. It is of the searchlight type, being equipped with a swivel bracket and is turned easily in the desired direction by means of a handle. A quality of the lamp is that the rear opens, facilitating cleaning.

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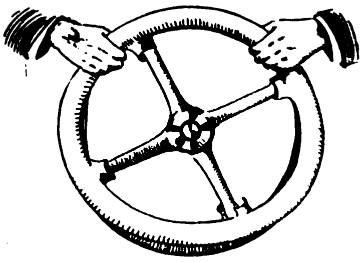
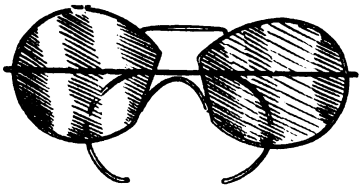
Steerease, as the name implies, is designed to eliminate vibration to the hands when operating a motor car. It comprises a soft, flexible, corrugated rubber covering which is split for attachment to the hand wheel. It is fitted and applied easily, being retained with cement, is made in different sizes, two colors, and is inexpensive. It is manufactured by the Goodyear Rubber Hose & Packing Company, 221 Chestnut street, Philadelphia.

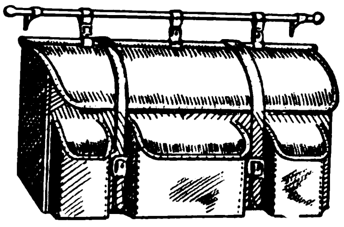


Autosun Glasses are manufactured by the Brown Autosun Company, Cleveland, O., and are designed especially for motorists, although they may be used by those exposed to artificial light. It is stated by the company that the peculiar blending of amber shades in the lenses neutralizes the ultra-violet rays of sunlight which disturb the eyes. The glasses are fitted easily and not only save the eyes from bright lights, but prevent the entrance of dust or foreign elements.


Autosun Glasses

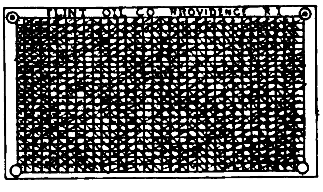
★

The Gordon Luggage Bag, manufactured by the Vehicle Apron & Hood Company, Columbus, O., will appeal to touring motorists as it is designed for attachment to the robe or coat rail and is provided with three collapsible pockets in addition to the main space. It is 30 inches long, 18 wide and five deep and when not in service occupies but little room. It is constructed of high grade material, weather and dust proof.


Gordon Luggage Bag

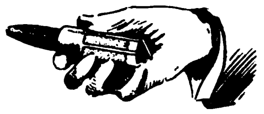
★

Flint's Heel Plates are marketed by the Flint Oil Company, Providence, R. I., and comprise an aluminum member five by eight inches. They are designed for attachment by screws to the floor boards, preventing the deterioration of the rubber matting by constant contact of the heels. The device may also be utilized to cover worn places and being corrugated prevents slipping of the foot. They are inexpensive, readily installed, and being of aluminum are maintained easily in a serviceable condition.


FLINT OIL CO. PROVIDENCE R. I.
Flint Heel Plate

★

The States Cigar Device, marketed by the States Manufacturing Company, 1035 West Adams street, Chicago, is a cylindrical aluminum holder in which the cigar is inserted and held. Its design is such that ashes and sparks are prevented from being blown into the faces of the other occupants of the car. It is provided with a lid for removing the ashes, and it is pointed out by the maker that a cigar will burn twice as long, as the member is protected from the wind.


States Cigar Device

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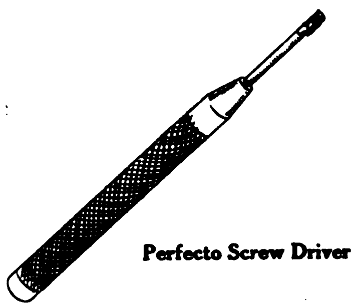
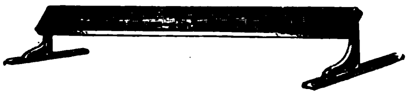
The Perfecto Screw Driver is produced by E. Edelmann & Co., 221 West Illinois street, Chicago, and being three inches in length is adaptable for making fine adjustments. The handle is knurled, providing a firm grip, and the blade is made of a high grade carbon steel, nickel plated. The device costs but a few cents and should prove a valuable addition to the tool equipment.


Perfecto Screw Driver

★

The Milwaukee Foot Rail is the product of the Garage Equipment Manufacturing Company, Milwaukee, Wis., and differs from the usual members in that the foot rest proper is constructed of wood covered with rubber matting bound with brass molding. It is produced in two styles, one having a track in which the rail proper slides, and the other non-adjustable. They are made in four sizes, 11, 15, 29 and 32 inches, respectively, and are moderately priced.


Milwaukee Foot Rail

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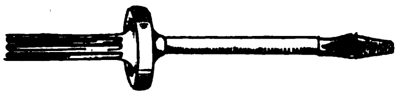
The Owen Valve Grinder is made by the Stewart Grinder Company, 171 Broadway, New York City, and is designed to take the place of the screw driver, or brace and bit. The weight of the tool is such that no downward pressure is necessary in grinding a valve, the device simply being rotated in the usual manner. The handle is corrugated and the grinder is nicely finished. Its price includes a supplementary spring for lifting the valve. The company also markets Gryndyn, a valve grinding compound which comes in screw top tin boxes and which is inexpensive.


Owen Valve Grinder

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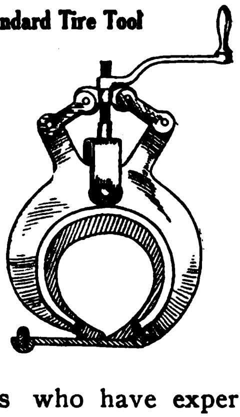
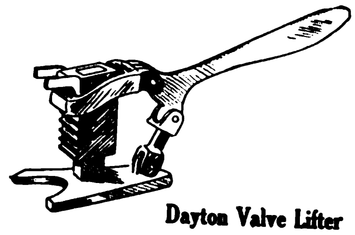
The Standard Tire Tool is manufactured by the Standard Tool & Supply Company, 42 West 15th street, New York City, and will appeal to motorists who have experienced difficulty in removing a shoe which has become rusted or frozen to the rim. A pair of

Standard Tire Tool



arms encircles the shoe, these being provided with recesses which engage with the bead of the tire and rim. The upper portions of the movable arms carry a toggle mechanism mounted upon a threaded bolt secured to the arm members. A handle having a threaded portion is rotated upon the bolt member which in turn imparts movement to the toggles and arms, causing the latter to contract and force the shoe away from the rim. The maker states that it will start the most stubborn tire and that it is guaranteed against breakage. It is made in two sizes and is designed solely for quick detachable rims.


Dayton Valve Lifter

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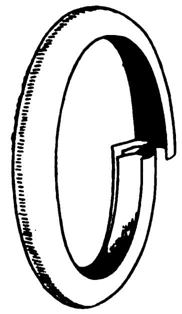
The Dayton Valve Lifter is manufactured by the Dayton Malleable Iron Company, Dayton, O. Qualities emphasized of the tool are that it may be operated by one hand and that it automatically locks into position upon the valve spring being compressed. These are made possible through a ratchet and pawl mechanism, the operating lever being provided with teeth registering with similar members on the stem of the tool.

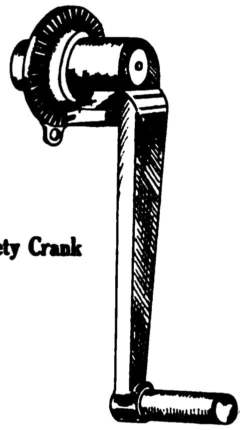
★

Kant-blo Innerliners are marketed by the Hampton Manufacturing Company, 1520 West Washington street, Indianapolis, Ind., and features claimed of these members are that they are self-vulcanizing and do not creep, chafe or buckle, creating damage to the inner tube. They are constructed of a layer of specially treated chrome leather placed between two layers of high grade Egyptian fabric and the materials are so placed together as to form a single yet flexible piece. The ends are lapped to facilitate installation.


Kant-blo Innerliner

★

The Cukor Safety Crank is designed for attachment to the crankshaft of the motor and to replace the usual handle, the maker claiming that it may be installed easily in a few minutes and without any alteration to the shaft. It is simple in construction, having but two parts, a ratchet and pinion, and its design is such that it does not detract from the appearance of the machine. When the motor is cranked a pinion engages with a ratchet, the latter being actuated by a plunger member. Any backfire or reverse movement is compensated for by the pinion automatically breaking contact with the ratchet. The plunger member also is disengaged with the motor shaft, allowing it to rotate, although the starting handle remains stationary. The device is manufactured by the Cukor Safety Crank Company, 58th street and Broadway, New York City.


Cukor Safety Crank

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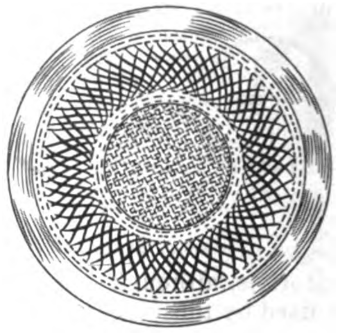
The Gasosava is the product of the Gasosava Company, Inc., 1270 Broadway, New York City, and is a device which is inserted between the carburetor and intake pipe or manifold. Its function is to assist in the complete vaporization of the fuel, and the maker holds that a decided economy is effected by its use. It differs from the usual devices of this nature in that it is fitted with a wick like screen which is so proportioned and constructed that the fuel is broken up as well as effectually screened. The maker states that after installation it is essential to restrict the opening of the needle valve as less gasoline is required to maintain the maximum efficiency of the motor.


Gasosava

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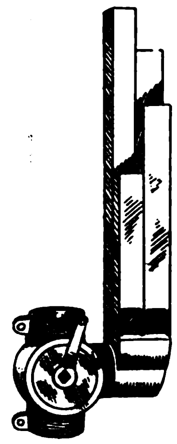
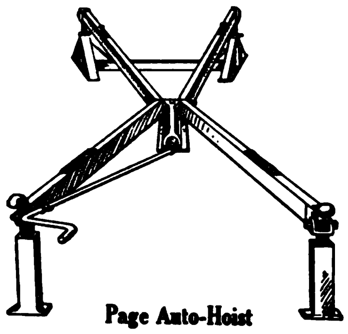
The Trinity Chimes Horn, for motorcycles is operated by the exhaust of the motor and it is said that a beautiful four-tone chime is obtained by the construction of the square brass tubes, four of different length being employed. Each tube is slotted in a manner similar to the pipes of an organ. The horn is connected on the exhaust pipe between the motor and the muffler and a cut-out valve is incorporated, which is actuated by a wire cable secured to a pedal near the driver. The tone of the


Trinity Chimes

signal may be varied by the opening of the valve member. It is marketed by the Waite Auto Supply Company, Providence, R. I.



Page Auto-Hoist

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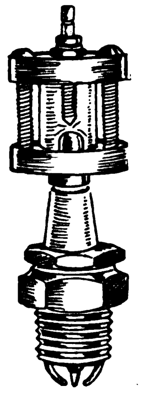
The Page Auto-Hoist, manufactured by the Page Auto-Hoist Company, Grand Rapids, Mich., is designed for jacking up the car, thereby relieving the tires of its weight when the machine is not in service, or repairs or adjustments are to be made. It occupies but little room in the garage. The machine is run over it and by rotating a handle the car is hoisted free from the floor. It is claimed that but little exertion is required to work the hoist and that a child may complete the operation in 10 seconds. It is made in differing sizes for varying wheelbases.

* * *

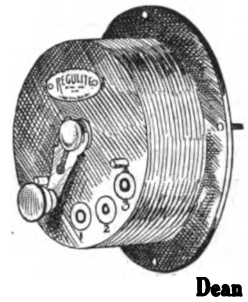
The Hemmeter Spark Gap, produced by the Hemmeter Spark Gap & Specialty Manufacturing Company, Pontiac, Mich., is a device which may be attached to any standard type of spark plug, its function being that of an auxiliary gap. By it the points of the plug are cleaned, as the flow of the secondary current is interrupted and built up sufficiently to overcome the resistance at the auxiliary gap. The current jumps the latter, increasing the intensity of the flame at the gap of the spark plug. The auxiliary member is composed of two pieces of fibre which are countersunk to take a section of glass tube, secured through the medium of two screws. The fire pin is adjustable as are the fibre pieces. A quality of the device is that it enables the observance of the spark.



Hemmeter Spark Gap

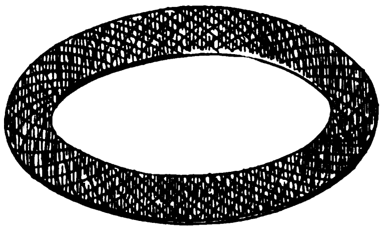
* * *

The Dean Regulite, marketed by the Waite Auto Supply Company, Providence, R. I., is an electrical device for utilization upon model T Ford automobiles when the magneto is employed as a source of current for lighting the headlights. With this type of generator the voltage varies with the speed of the motor and if the lamps are not of proper size, at high motor speeds they are likely to become damaged. The Dean Regulite regulates the voltage, its principle being that of resistance in the circuit, and it is so designed that a steady light is provided at different speeds, the lamps being protected from excessive voltages. The switch member has four steps or contacts to enable the adaptation of the system to generators of varying output of current. Another quality of the device is that it permits of dimming the lights when operating in the city. The Regulite is neatly constructed, takes the place of the usual lighting switch, and may be located upon the dash or in any other convenient place. It is moderately priced.



Dean Regulite

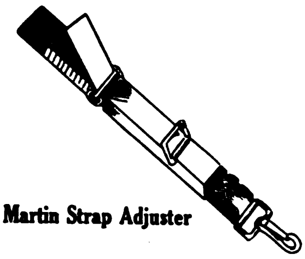
Burgmann's Gaskets are manufactured by Feodor Burgmann, 5 Beekman street, New York City, and are constructed in varying sizes to meet individual requirements. They are made of a high grade asbestos cloth, with and without wire insertion, as well as graphited or ungraphited. They are designed to withstand high temperatures and moisture, and are made in different thicknesses. The maker also produces Janos sheet, a high grade packing particularly adapted to motor work, and Joudol "M," a packing lubricant.



Burgmann Gasket

* * *

The Martin Strap Adjuster will appeal to motorists who have experienced difficulty in attaching the top strap hook members to the eyes of the frame member when the top is raised. Sometimes it is necessary to exert considerable energy to accomplish the operation and the top and bows are strained. The Martin device is so constructed that its locking mechanism may be loosened easily and quickly, the strap lengthened and the hook snapped into place. The adjuster is then locked to its original position. Two comprise a set which is moderately priced. The device is made by the Martin Manufacturing Company, 515 Vine street, Cincinnati, O.



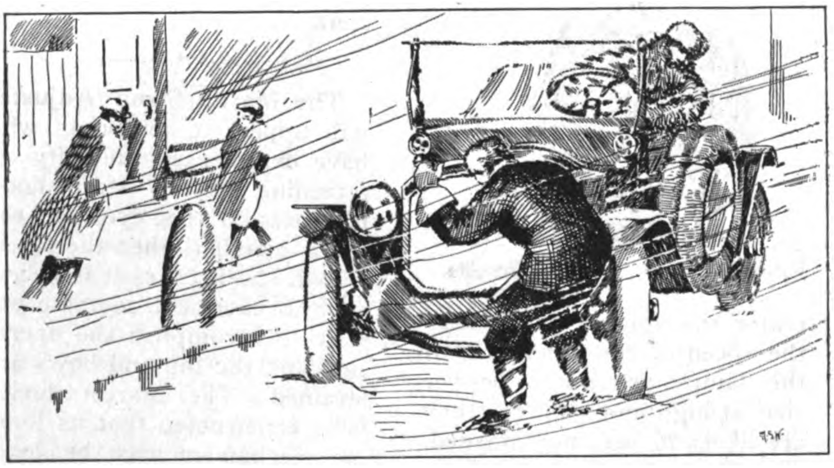
Martin Strap Adjuster

EFFECT OF COLD ON CARBURETION.

Why Motors Are More Difficult to Start with Heavy Fuel—Reasons Advanced for Its Use—Factors Making for Proper Vaporization—Priming Devices Which Will Appeal to the Owner.

PROPRIETORS of garages are being called upon these cold days to advise their customers how to overcome the starting troubles created by the heavy grade of gasoline now being marketed. More or less complaint always arises at this season, but the situation presents new features which have not been noted heretofore except in the severe cold weather of the winter months. While it is admitted by refiners that the motor fuel of today is heavier than it was several years ago, there may be a number of reasons for starting troubles, such as ignition, etc. Before considering the devices produced for overcoming these difficulties, a few words upon carburetion will prove of value.

Gasoline, as is well known, is extremely volatile; that is, it will evaporate readily and its vapors will combine with air to form an inflammable gas, and at ordinary temperatures. To carburet means to combine certain proportions of air with any gas so that its combustion or burning will be so rapid that it becomes an explosion. The amount of air required will vary within certain proportions and some mixtures will burn sooner than others. Combustion is simply burning, and may be very slow, moderately fast, or practically instantaneous.



Starting a Cold Motor in Winter Is Usually Accompanied by Considerable Effort on the Part of the Driver.

If there is too much or too little air in proportion to the fuel vapor, the burning or combustion will be slow and the explosion weak. It is evident, therefore, that the richer the mixture in fuel, the quicker it burns, though best operating results are not obtained with a rich mixture, this being better adapted for starting or slow running. While it would appear a simple matter to obtain the desired mixture, and that almost any device which would permit of a current of air coming in contact with the liquid fuel could produce a combustible gas, it should be borne in mind that the object sought by the makers of carburetors is to design an appliance capable of producing a mixture which will be of proper value at all motor speeds, as well as permitting of flexibility without excessive use of fuel.

As previously stated, gasoline vaporizes very readily at ordinary temperatures, but if it is very cold it will not vaporize in sufficient quantity to make the proper mixture and ordinarily there will be too much air and not enough vapor, making for a lean mixture which is slow burning. Condensation is another factor to be considered and although the carburetor may be performing its function properly, the mixture may be "killed" on its way to the combustion chamber. Obviously the remedy would appear to be the enriching of the mixture, but while this would favor starting it would not make for proper carburetion at high speeds nor compensate for the varying compression values with the throttle opening. To vaporize the heavy fuel successfully for starting purposes, as well as to provide a suitable mixture at varying speeds, the carburetor manufacturer incorporates self-priming devices for enriching the mixture for starting or for restricting the air, or both. With either construction it is held by carburetion authorities that it is possible to start the motor in cold weather provided its components are performing their functions properly. This contention appears to be borne out in practise by some cars, the owners of which experience but little trouble in starting the motor when it is cold.

Reverting to the subject of fuel, the heavy grade and increased cost of which are viewed with alarm by motorists and those utilizing internal combustion engines: Those who are familiar with the products of petroleum, from which motor fuel is derived, hold that the advancing demand has compelled refiners to obtain a greater percentage of carburetant from their crude oil.

Technically, gasoline is the lightest distillate obtained from petroleum and its gravity is 90 to 78 degrees Baume. Only 1.5 per cent. is secured from the total weight of crude oil. Next in the list comes naphtha C, amounting to 10 per cent. of the whole and having a gravity of from 78 to 68 Baume. These two distillates were formerly combined for motor car use, but the increased demand for fuel forced the refiners to add to these, naphtha B and A having two and 2.5 per cent., respectively, of the crude petroleum base and gravity ranges between 68 and 60 degrees Baume.

While it would appear from these figures that a gallon of crude oil yields 16 per cent. of its weight in motor fuel, it should be borne in mind that no crude will show this percentage at all times. Even the best of Pennsylvania crude will only show 16 per cent. occasionally, while others yield but two, and some none at all. The amount of motor fuel distilled from the crude varies from four to 16 per cent., according to the richness of the oil. When it is considered that one state yielded 81,000,000 of the 220,000,000 barrels of crude in 1911, and that the percentage of motor fuel derived was exceedingly small, it would appear that the average would be nearer 10 than 16 per cent.

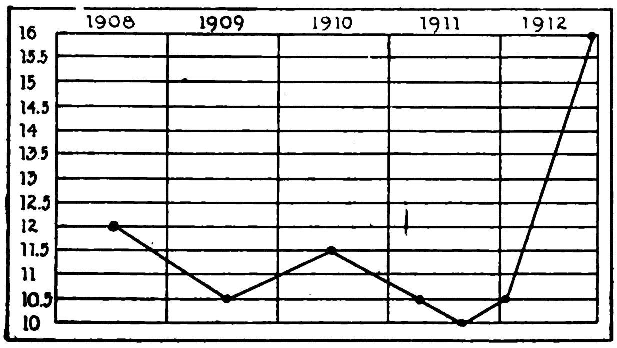


Chart Showing the Fluctuation in Price of Motor Fuel from 1908 to the Present.

It is held by some that the refiners have not increased their output, but statistics show this to be erroneous. The total production of crude petroleum in 1908 was 178,527,355 barrels, this yielding 115,000,000 barrels of refinery crude, from which motor fuel is obtained. The total production of crude in 1911 was 220,449,391 barrels or approximately 118,000,000 barrels of crude refinery, an increase of nearly 42,000,000. It is estimated that for the first six months of the present year the oil fields yielded 62,000,000 barrels of crude refinery, at which rate the total production for 1912 may be placed at 124,000,000.

It is but natural to assume that the refiner is interested in the by-products, the marketing of which has a decided bearing upon the price of motor fuel. One authority holds that the products of the distillation of crude petroleum yield approximately the following percentages:

Gasoline (petroleum spirit)	1.5
Naphtha C	10.0
Naphtha B	2.5
Naphtha A	2.0
Kerosene	50.0
Lubricating oil	15.0
Paraffine wax	2.0
Residue and loss	16.0

Another claims that but 40 per cent. of the crude refined is kerosene, having a gravity of between 56 and 32 degrees Baume—too low for motor use. These figures, however, will vary according to the richness of the crude, the method of refining, etc., as previously explained. It is evident that to obtain the desired motor fuel an enormous amount of kerosene is left on the producers' hands and that gasoline is the principal product and kerosene the by-product, a condition dissimilar to that previous to the appearance of the internal combustion engine when there was practically no market for the inflammable fluid.

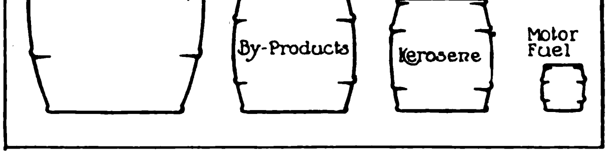
As the price of a product is governed largely by the prices of its by-products, it follows that the increased production of kerosene bears a very close relation to the cost of motor fuel. With the amount of kerosene increasing proportionately with the distillation of motor fuel, the marketing of the by-products becomes a serious problem with the refiners.

It is pointed out that the demand for kerosene is not keeping pace with that of motor fuel and this contention appears to be borne out when it is taken into consideration that electricity is replacing oil even in the agricultural districts. Thousands of farmers and others residing beyond the limits of the central service station install their own lighting plants, operated by gasoline motors. It is estimated that over 800,000 gasoline engines were sold last year, these ranging from the tiny machines that run separators to those of 3000 horsepower utilized in larger power plants for generating electricity and other purposes.

The demand for motor fuel is further augmented by the increasing popularity of motor boats and while figures are not available dealing with the fuel consumed by these engines, they doubtless would prove interesting. Statistics of motor cars show that the number of machines in 1908 was approximately 150,000, and that up to June of the present year there were 890,000, a gain of nearly 500 per cent. Add to these the thousands of motorcycles and there is reason for apprehension. The day is not far distant when the motor fuel problem will assume serious proportions.

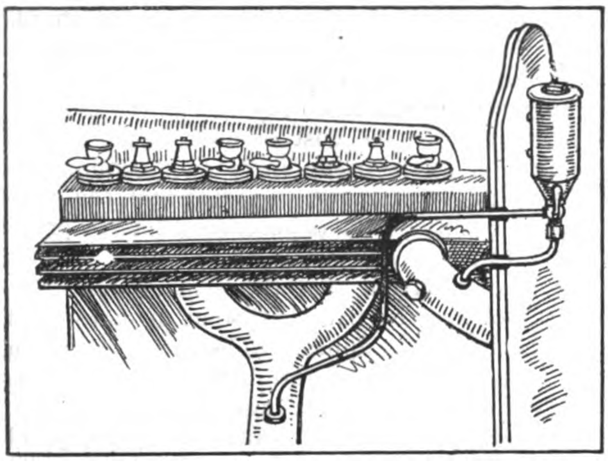
Many motorists believe that the heavier fuel is not as good as that of lighter gravity, but although starting is made more difficult, the new product has a greater number of heat units and consequently makes for more power.

It is possible, however, even with improved carburetors and certain types of motor starters, that the temperature may be so low that the fuel will not vaporize sufficiently to make an explosive mixture. In such instances the temperature must be raised to a carburetion value.



The Amount of Motor Fuel Obtainable from a Barrel of Crude Refinery Varies from Four to 16 Per Cent.—The Increased Production of Kerosene and Other By-Products Bears a Very Close Relation to the Cost of Motor Fuel.

For the automobile that is garaged in a cold building there are a number of devices which have for their object keeping the motor or the water warm. These include an electrical heater manufactured by the Consolidated Car Heating Company, New York City. It is placed on top of the motor, being connected to the main line by a plug, and it is held that by its use freezing of the water is prevented, making starting an easy matter in the morning. Another type, the Never-out, made by the Rose Manufacturing Company, Philadelphia, utilizes a small amount of city gas which is consumed in a special burner contained in the heating apparatus. This is attached to the radiator, and when in operation the water is kept warm, as well as the motor. A safety screen eliminates possibility of fire.


With the Gilson Motor Starter the Intake Manifold Is Primed and Heated Air Is Taken from the Exhaust.

While the regular fuel will yield good results for this purpose in ordinary temperatures, when zero weather is encountered it will be necessary to employ a more volatile fluid, such as sulphuric ether. This should not be used alone, but mixed with the fuel, utilizing about 25 per cent. ether. It should be carried in a bottle having a ground glass stopper as it evaporates easily.

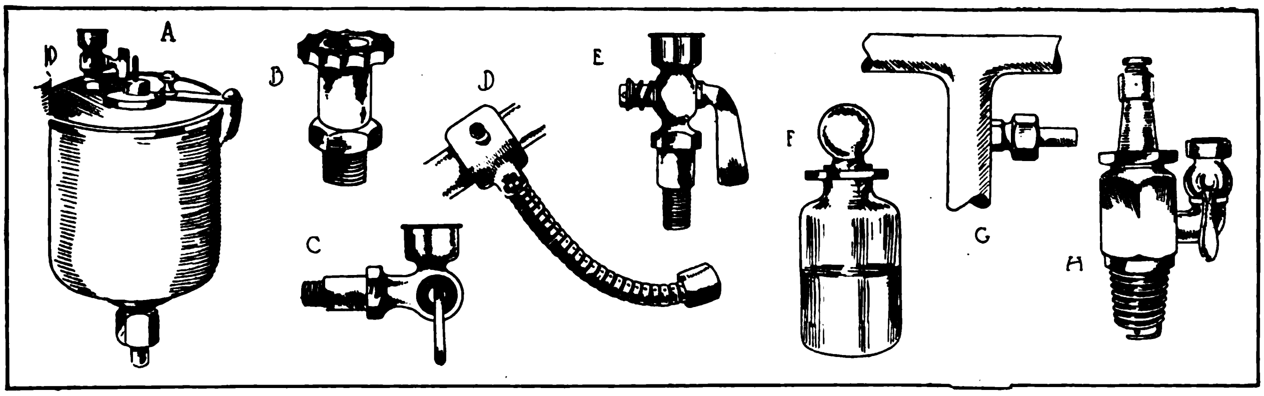
The heavy motor fuel has resulted in the exploitation of a number of devices for making starting easy. The majority operate on the priming principle, although one heats the walls of the intake manifold by electricity. The Gilson motor starter, made by the Gilson Motor Starter Company, Indianapolis, Ind., not only makes for easy priming of the inlet pipe, but after the first explosion the mixture is preheated before entering the cylinders. The supply of gasoline is carried in a neat brass cup on the dash and the fuel is fed to a three-way valve. From the latter a tube leads to the exhaust manifold, around which it is wound once, and another pipe is tapped into the intake manifold. In starting the valve member is opened, allowing a small quantity of gasoline to flow to the intake pipe. Cranking the motor results in air being drawn over the wet pipe, making a rich mixture. Continued operation is assured through heating the intake pipe by the hot air drawn from the exhaust. The company announces a 1913 model which differs from that described in that the fuel container is located inside the hood and control of the fuel and hot air is by a handle located convenient to the driver.

Two priming attachments are marketed by the Fowler Lamp & Manufacturing Company, Chicago, these being the Webb Jay Automatic and the Fowler. The former comprises a container having a screw cover and a controlling handle. The supply of fuel is taken by suction from the main fuel line by a pipe and another tubing leads to two points in the intake manifold. The gasoline is fed automatically to the container and the flow of fuel to the intake is easily controlled by the operating handle. It is claimed of the device that the mixture may be enriched for starting and operating the engine until it has become sufficiently warm. Another feature lies in that the cylinders may be primed upon stopping the motor, making it possible to start on the spark.

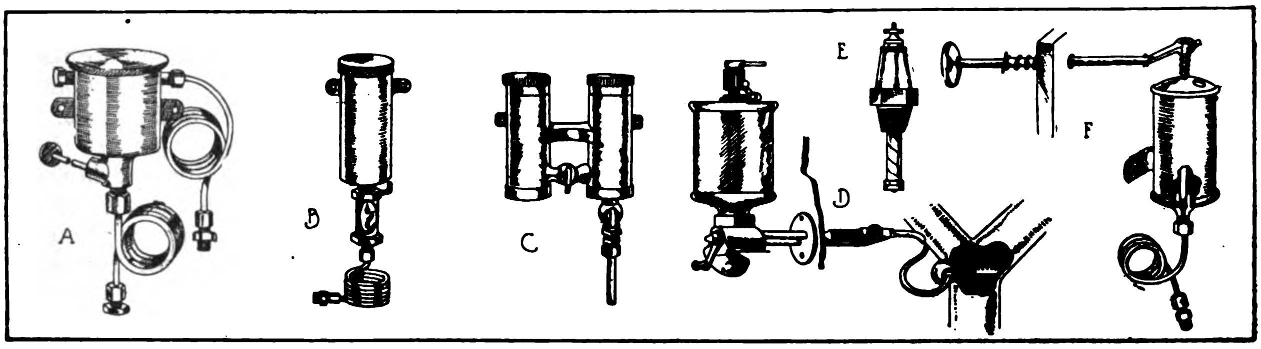
The Fowler device permits of priming the intake pipe from the seat, it being operated by a push handle and the controlling valve closes automatically when the handle is released.

The Sight Feed primer, made by the Nelson Manufacturing Company, Chicago, operates on a similar principle, but differs in that a sight feed is incorporated, permitting the operator to note the amount of gasoline fed to the intake manifold. The National Manufacturing Company, Kalamazoo, Mich., markets the National compound mixer and primer, comprising two vessels, one of which contains the fuel. The flow of the fluid to the intake manifold is controlled by a valve and the mixer regulates the amount of air.

The Buckeye Sure Starter, manufactured by



Illustrating Devices Facilitating the Starting of the Motor: A, Petcock for Injecting Ether in Float Chamber; B, Morgan Priming Cup; C, Design for Horizontal Cylinders; D, Flexible Tubing for Conveying Heated Air to Carburetor; E, Conventional Type of Priming Cup; F, Ether Should Be Carried in a Bottle Having Ground Glass Stopper; G, Tapping Intake Pipe; H, All-in-One Spark Plug.



Illustrating Devices Designed for Priming the Motor: A, Webb Jay Automatic Suction System; B, Nelson Sight Feed; C, National Mixer and Primer; D, Buckeye Sure Starter; E, Stalit Plug, Heated by Electricity; F, Fowler Self-Closing Priming Cup.

the Central Brass & Fixture Company, Springfield, O., is held to produce a starting mixture within the intake manifold by a special spraying device. The fuel is contained in a glass member of the oil cup type. To utilize, the control lever is moved to the left and the fuel valve opened, allowing a small quantity of gasoline to flow. The control handle is then moved to the right and the motor cranked. The amount of air led to the spraying nozzle in the intake pipe may be regulated and the maker points out that proper carburetion is secured easily and full economy is effected thereby. In cold weather it is recommended that a one-quarter solution of ether be employed. The vessel holds enough fluid for 12 to 16 starts, depending upon the size of the motor.

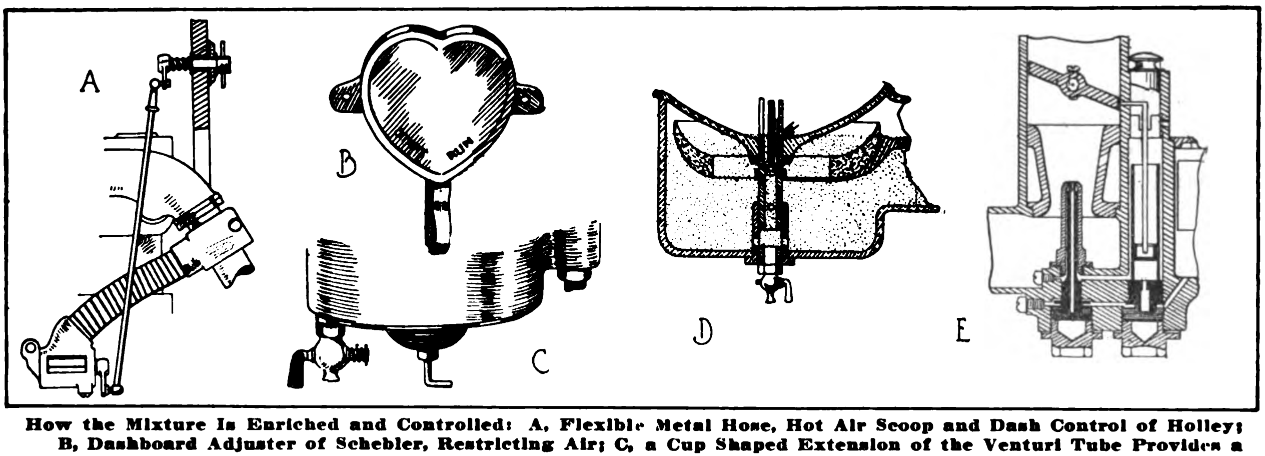
With the Stalit heating plug, marketed by George Staats & Co., Brooklyn, N. Y., the air in the intake pipe is heated by electricity. The plug is screwed into the intake manifold and a wire is led to it from the battery. By closing the circuit it is held that the plug will heat the manifold, preventing condensation of the mixture as well as making for easy starting. It is operated by any six-volt battery.

Reference has been made to the devices incorporated in carburetors for making possible starting the motor with a heavy grade of fuel. The principle involved is that of enriching the mixture, and this is accomplished by restricting the air or by using an abnormal amount of fuel. This practically is what the motorist does when he shuts off the air by closing a butterfly valve and by depressing the float or flooding the carburetor with an abnormal amount of fuel.

Several manufacturers, including the makers of the Rayfield, Stromberg, Schebler, Holley, Newcomb, New-Miller and others, provide dash controls whereby the air may be restricted, the carburetor primed, etc., by the driver without leaving his seat. By the use of these dash controls it is possible for the operator to change the mixture for starting or running as desired.

It is noticeable that many makers are equipping their carburetors with means for conveying warm air from the exhaust pipe to the air intake of the vaporizer in addition to water jacketing the float chamber. While either construction does not effect starting, the use of a flexible metal tubing does facilitate the vaporization of the fuel after the first few explosions are obtained. Lack of space prevents describing the various methods employed in carburetor construction for making starting possible without priming or the use of artificial means, but the accompanying illustrations depict sectional views of vaporizers in which the mechanism is incorporated, and a little study will enable the reader to understand the principles involved.

Motorists recently visiting the Dead River region, Skowhegan, Me., reported considerable trouble on "Horseback" road, Highland. A culvert where a brook crosses the road had been dammed by beavers and the highway was flooded for over a foot. When a dam is removed the animals, who never desert a work once established, rebuilt it in a night. Old trappers maintain that this will occur as long as there are two beavers left in the colony.

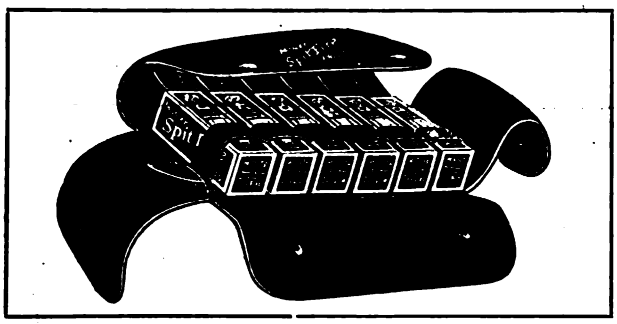


How the Mixture Is Enriched and Controlled: A, Flexible Metal Hose, Hot Air Scoop and Dash Control of Holley; B, Dashboard Adjuster of Schebler, Restricting Air; C, a Cup Shaped Extension of the Venturi Tube Provides a Starting Charge in the B-D; D, Self-Priming Feature of the Bennett, on the Surface Principle; E, Showing the Priming Tube and Secondary Well of the Zenith.

MOSLER'S CHRISTMAS PRESENT.

Spit Fire Spark Plug Maker Also Specializing in Plugs for Particular Motors.

As a Christmas present, the offer extending from Dec. 1 until the close of the New York shows, A. R. Mosler & Co., Mt. Vernon, N. Y., is giving with each order for six platinum pointed, .5-inch metric or 7 8-18 platinum pointed Spit Fire spark plugs, a handsome genuine leather Spit Fire spark plug case, like that illustrated herewith. The case not only holds the plugs in their individual cartons, the strap being so arranged that they may be carried in the original packages, but affords the proper protection for the extra members which the careful driver has with him.



Leather Spit Fire Spark Plug Case, Which A. R. Mosler & Co., Offers as a Christmas Gift.

Another important announcement is made by this concern in that it is maintained that almost every engine built for 1913 cars embodies some peculiarity or eccentricity, these features changing conditions so that it has been deemed advisable to specialize in plugs for several of the foremost motors now being used. In the future each plug sold will carry a special tag stating for what particular car it has been designed.

The cylinder walls of every motor vary, according to the Mosler concern, thereby making it necessary to furnish plugs of different lengths in order to bring the bases far enough through the wall to make them self-scavenging. One cylinder cap is held to require a longer threaded plug than another. If the plug is set in a recess it is considered advisable to have a deep chamber construction to make the member easily accessible and convenient for ordinary or even special wrenches.

The question of placing the ignition spark in the proper manner at the exact point in the cylinder where it will give the best results has been studied with much care by this company and it is stated that many of the 1913 models of the leading factories will be found equipped with Mosler's special plugs, some of which are shown in an accompanying illustration. Some engineers specify the closed end Spit Fire type with platinum points, while others have chosen the open end plug, either with one or two points, as best suited to their motors. This discriminating policy of the manufacturers has resulted in about 20 new models of the Spit Fire, some of which will be found on the following cars: Alco, Atterbury, Bergdoll, Chalmers, Cunningham, Dorris, Fiat, Hudson, Lippard-Stewart, Locomobile, Paige, Pierce-Arrow, R-C-H and White.

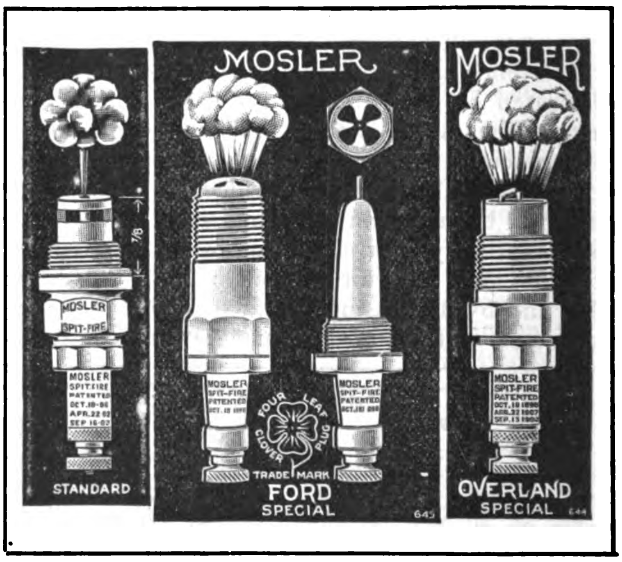
In this connection it will be proper to note that Mr. Mosler has issued the third edition of his spark plug size booklet, which gives the size of plugs used on each American made automobile. This valuable information is for free distribution to those who make request of the company.

THE SECOND HAND CAR PROBLEM.

Metropolitan Dealers' Association Believes It Has Discovered a Satisfactory Solution.

Recently the Automobile Dealers' Association, Inc., of New York City, held several meetings relative to the second hand car problem and the situation that was developed proved somewhat startling to the dealers themselves, as many of them had not realized to what an extent this feature of the industry had grown. It was pointed out that many customers, having an old car to trade in on the price of a new one, managed to get the best of the dealers by bidding one against another, often forcing allowances on the old cars far in excess of their real market value. This resulted in a cut in the small margin of profit that should be received from the sale of the new car. The dealers frankly admitted the situation had arrived at a stage where curtailment was necessary or many would have to go out of business.

It was agreed that when customers have second hand cars to trade in, the dealer will take the car, place it on the floor, advertise it and endeavor to secure a customer for it at the best possible price. In the interim, if the customer signs an order for a new car and demands immediate delivery, he is to pay cash for it. When the old car is sold the money is given to the customer with-


MOSLER
MOSLER
7/8
MOSLER SPIT-FIRE
MOSLER SPIT-FIRE PATENTED OCT. 18-98 APR. 22 02 SEP 16-02
STANDARD
MOSLER SPIT-FIRE PATENTED
FOUR LEAF CLOVER PLUG
TRADE MARK
FORD SPECIAL
645
MOSLER SPIT-FIRE PATENTED
MOSLER SPIT-FIRE PATENTED
OVERLAND SPECIAL
644

Some of the New Spit Fire Spark Plugs: At Left, Standard Design; in Centre, Ford Special and Detailed Construction; at Right, Overland Special.

out any charge for disposing of his car. Should the old car be sold before the new one is delivered the proceeds can be credited on the new car. In this way the dealer makes a clean sale and except for the expenses of selling the customer's car, receives the profit on the new car to which he is entitled.

AUTOMOBILE SCHOOL METHODS.

Students at Boston Y. M. C. A. Have Opportunity to Study Along Varied Lines.

Day Baker, New England Manager, General Vehicle Company.

The methods of teaching automobile courses vary greatly in different sections of the country. Perhaps no institution in the East has a better record for successful management than the Boston Y. M. C. A. Automobile School, which not only has the usual evening classes, but can boast of a large day class as well. An accompanying illustration shows 55 day students on a tour of inspection of the Packard service depot in that city.

Officials of the Packard company placed a truck at the disposal of the class and took particular pains to explain all the details of the big establishment, not forgetting the various systems and methods in use in each department. The students were very glad of the opportunity to gain first hand information concerning the practical workings of the service station, and the tour came as a fitting adjunct to a series of talks now being delivered by several Boston dealers.

Included in this list of talks was a recent illustrated lecture by Day Baker, New England manager of the General Vehicle Company, his subject being "Electric Wagons and Trucks and Their Relation to the Gasoline Driven Vehicle." Mr. Baker did not confine himself to the products of his company, but gave a general discussion of the whole industry. Several factory representatives also have been heard by the students.

Party of Students at Boston Y. M. C. A. Automobile School, Inspecting Packard Service Station in Packard Truck.

ADDS MORE FACTORY ROOM.

Goodyear Tire & Rubber Company Acquires Another Plant to Prepare for Growth.

The Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, has acquired the entire property of the Akron branch of the Great Western Cereal Company, which is near the present Goodyear plant, and three new buildings are in course of construction. They will be used for storage until such time as it is necessary to utilize the space for manufacturing. When the additions are entirely completed, about March 1, 1913, the Goodyear company will have a capacity of 8000 tires a day, which will be just double that of the plant a year ago.

"The three latest additions will aggregate 335,300 square feet of floor space," says C. W. Sieberling, vice president of the Goodyear company. "This brings the total up to 1,935,300 square feet. To realize what this means, imagine a factory 50 feet wide and one story high. If the Goodyear factory were built in that way it would be over six miles long. Our sales for the fiscal year ending Nov. 1, approximated $25,000,000. At least one-third of the total cars produced during the 1912 season were equipped with Goodyear tires and it is safe to say that Goodyear tires will go on half the cars built next year. Contracts indicate that we shall supply to car makers 200,000 sets of tires."

WHITE'S NEW BOSTON BRANCH.

Arrangements Completed for New Sales and Service Station.

The White Company of Boston, the New England branch of the White Company, Cleveland, O., maker of White pleasure and commercial lines, has completed the preliminary arrangements for the erection of a new sales and service station at 1024-28 Commonwealth avenue.

Clinton J. Warren has been selected as architect and has the plans for the new building well in hand.

REEVES WITH TRUFFAULT-HARTFORD.

Former United States Motor Manager Now Vice President of Hartford Suspension Company.

Edward V. Hartford, president of the Hartford Suspension Company, Jersey City, N. J., maker of Truffault-Hartford shock absorbers, electric starter and lighter and other high grade motor car specialties, has announced that Alfred Reeves, formerly general sales manager of the United States Motor Company, has been elected vice president and general manager of that concern. Mr. Reeves, it was stated, has acquired a substantial interest in the company. He will assume his new duties early in January.

Probably no man in the industry has a wider acquaintance or is more favorably known among automobile manufacturers, engineers and dealers than Mr. Reeves, and coupled with the inventive genius of Mr. Hartford he may be expected to bring the company's products into greater prominence than ever before. The company has just completed in Morgan street, Jersey City, an additional eight-story steel and cement factory structure, supplying more than 100,000 square feet of floor space for its productive work.

W. K. Hadley, Factory Representative, on 35,000-Mile Trip in Lenox Six.

A LITTLE TIRE HISTORY.

Interesting Evolution of the Present Day Non-Skid Pointed Out.

It appears that the present day non-skid tire is an evolution from the vacuum rubber flesh brush, and that A. E. Morrison, once noted as a bicycle racing rider and now western sales manager of the R-C-H Corporation, maker of R-C-H cars, is responsible for its adaptation to the automobile. In 1898 a widely known manufacturer of rubber goods decided that his flesh brush idea might be applied to the bicycle tire. He got into touch with Morrison and equipped his bicycle with his new non-skid tires. The latter went from coast-to-coast demonstrating their value in various racing events.

Six years later Morrison had won fame throughout New England as an automobile racing driver. He recalled his experience with the non-skid bicycle tires and decided to try them on his car. The manufacturer of 1898, to whom he unfolded the proposition, declared he did not have the necessary capital, and Morrison offered to pay for the molds, the two rough tread tires to be ready for his race at Readville, Mass., May 30, 1904. That day he won two five-mile events, going the distance in 6:00, a remarkable record for the time, in a touring car with body.

In view of this interesting resume, it is not strange that Morrison was able to induce the R-C-H Corporation to equip its 1913 model with non-skid tires all around. It is stated that this is the first instance in which a moderately priced car has thus been fitted as regular equipment.

LONG TRIP IN LENOX SIX.

Factory Representative Plans to Cover 35,000 Miles in New Car Before Returning.

That this is to be in many respects a six-cylinder year is being brought home to prospective owners nearly every day. Among the manufacturers who are bringing out new models with motors of this type is the Lenox Motor Car Company, Boston, Mass., which experienced such splendid success with its four-cylinder car last year.

An accompanying illustration presents W. K. Hadley, one of the factory representatives of the company, who recently began a 35,000-mile trip in the interest of the concern. Already he has covered 5000 miles, visiting the cities in New York, New Jersey and Pennsylvania and closing numerous agencies. He expects to arrive in Chicago in due time and may possibly reach the Pacific Coast. Thus far he has met no trouble of any nature.

CARROLL PURCHASES BUSINESS.

Removes Carriage Shop to New Bedford and Will Specialize in Automobile Bodies.

William E. Carroll, for 14 years with the G. L. Brownell carriage factory and for the last three years with the S. C. Pease Carriage Building Company, Merrimac, Mass., has purchased the latter business and has transported it to New Bedford, Mass. In addition to continuing the carriage business, Mr. Carroll will manufacture specially ordered bodies for automobiles, motor hearses and undertaking wagons, fire and patrol wagons. Mr. Carroll has already achieved some success along this line, having built, it is said, the first complete automobile hearse ever made in the United States, for Frank E. Campbell, New York City.

Recent Patents of Interest

Wright Windshield.

A patent for a windshield adaptable to motorcycles or bicycles has been granted to Chauncey M. Wright, Philadelphia. It comprises two shields, so mounted as to form a triangle with the apex in the direction in which the machine is travelling. The shields are clamped to the handle bars and springs are provided as well as means for folding the shields.

Bishop Vehicle Lock.

The increasing number of thefts of motor cars has been productive of several patented devices to prevent use of the machine by others than those intended. Ephriam M. Bishop, Kingston, N. Y., has applied a principle employed with horse drawn vehicles, by securing the wheels on either side with chains to prevent traction. In the Bishop device one end of the chain member is provided with a casing having a slot, also a spring member having a rigid connection with the casing. A locking head is utilized on the free end of the spring member and is adapted to be inserted through the slot. The chain encircles the felloe of the wheels, preventing their rotation.

Hevey Tire Tool.

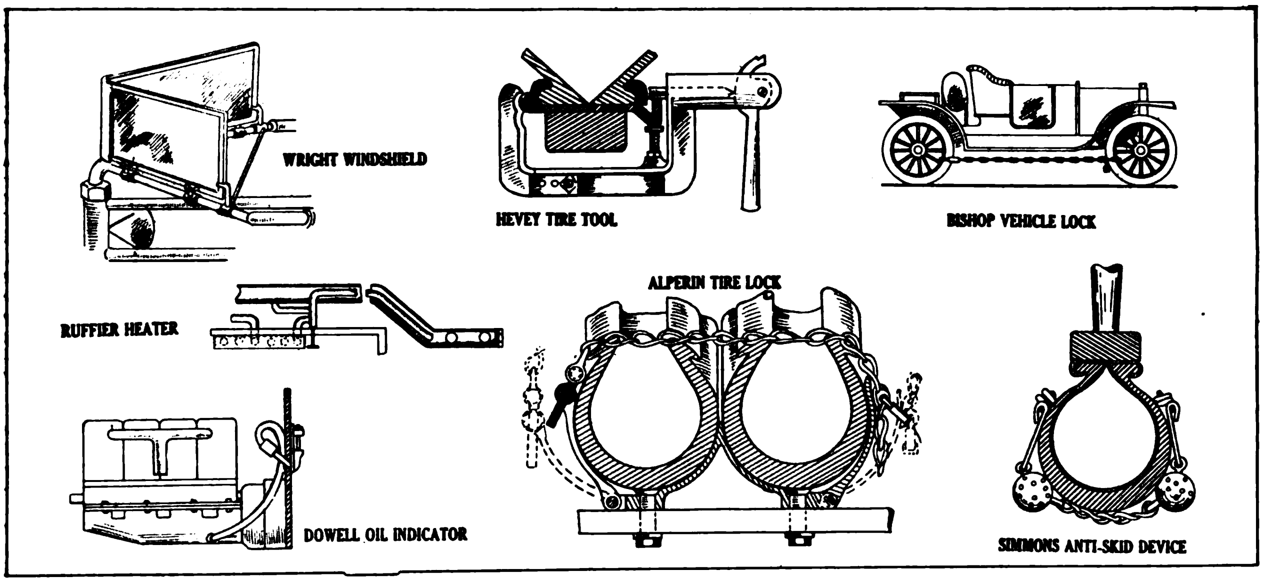
Herman Hevey, Biddeford, Me., has been granted a patent for a tire removing tool which is constructed to exert considerable energy through a lever and fulcrum arrangement. The body portion of the device is provided with spaced arms, one of which is designed to engage with one side of the rim while the other is fitted with a casing. The arm members are adjustable and the casing member carries a vertical member which may be raised or lowered to engage with the rim. A plunger is horizontally mounted in the casing and is movable toward the first named arm. The rear of the plunger is formed with oppositely inclined faces. Energy is imparted by an actuating lever fulcrumed in the outer end of the casing and provided with a cam surface adapted to bear against the rear end of the plunger. The cam surface is notched at one end for engagement with the inclined faces of the plunger for the purpose of locking it.

Ruffier Heater.

Gaston Ruffier, New York City, has patented a device for heating the interior of the motor car by utilizing the exhaust gases of the engine. The interior of the exhaust pipe is provided with a tubing so arranged that the gases are led to a radiator member, thence to the outer air by the way of the regular exhaust pipe. The device is provided with a by-pass so that the flow of gases to the radiator may be controlled.

Alperin Tire Lock.

A device for locking the tires to the running board of the car and thereby preventing their theft, has been patented by Bernard A. Alperin,



Showing Some of the More Recent Ideas of Inventors of Appliances Adaptable to the Motor Car, Including a Heating Device, Tire Lock, Anti-Skid Attachment, Vehicle Lock, Etc.

New York City. A pair of supports, each having a movable arm, are secured to the running board by means of bolts and lock nuts. The inner and outer arms are adapted to be moved to permit of fitting the tires which are retained by a chain secured to one of the movable arms. The other arm is provided with an eye member which engages with a link of the chain and means for locking are secured through a padlock or other suitable member.

Simmons Anti-Skid Device.

Turner W. Simmons, Bridgeport, Conn., assignor of one-half to William C. Bowers of the same city, has patented an anti-skidding device which combines chain or link members with flexible rubber balls. A pair of side links have eyes disposed at an angle to each other and have central enlargement at the apex of the angle. The rubber balls are provided with studs and links are utilized to connect or retain the spheres, the chains extending across the tread of the tire.

Dowell Oil Indicator.

A device for indicating the amount of lubricant in the crankcase or sump of a motor has been patented by Chester M. Dowell, Huntington, Ind. It comprises a plate having a tubular extension at one side and arranged at an acute angle, also a hollow projection on the opposite side of plate. The openings of the tubular and hollow members are in communication to form a U shaped passage. The plate has a projection on the same side with the hollow projection and spaced therefrom. A sight tube is arranged between the projections, and a plug is threaded into the upper member and adapted to confine the sight tube which is formed with a vent opening.

OTHER PATENTS GONE TO ISSUE.

Window Cleaner, Elkana F. Cunningham, Clarksburg, W. Va. A window cleaning device including a slide and swinging bar and means for actuating the same.

Gas Lighting Device, Lucius James Bachus, Louisville, Ky. A wheel of sparking material is mounted on a clamp member in proximity to the burner and the gas is ignited by rotating the wheel.

Top Attachment, Lewis P. Halladay, Chicago. A holder for top bows comprising a slotted tube having recesses to engage the bows and means for locking same in position.

Grease Cup, Robert Hickish, Tuckahoe, N. Y. The plunger actuating the piston is provided with a ratchet stop and the base of the cup has a shut-off valve.

Spring Frame, Charles G. Stephenson, Denver, Col. A spring frame for motorcycles, two being employed, these being secured to the upper and lower part of the main frame and attached to the rear fork and frame of the wheel.

Distributor and Insulator, Ernest H. Kuntz, Arcata, Cal. A combined insulator and distributor of current comprising an internally threaded body portion, and petticoats depending therefrom, said body portion having an external thread having its ends terminating short of the ends of said body.

Motor Starter, William Emil Block, Toledo, O. The flywheel of the motor is provided with ratchet teeth meshing with similar members on a plunger and pawl mechanism which is actuated by fluid pressure.

Motor Starter, Milton E. Cole, Akron, O., assignor of one-sixth each to Charles A. Smith, Albert Burnett, Edward L. Scrote and James R. Rowlett, all of the same city. The crankshaft of the motor has rack teeth and a plunger rod having similar teeth is actuated by pressure. Means are provided for sliding the rack member on the crankshaft out of and into engagement with the plunger.

Auto-Fender, Artie L. Raven, Vista Grande, Cal. A fender for vehicles comprising a vertical screen, means for connecting same to the vehicle, and a horizontal apron pivoted to the screen member. A lifting device is incorporated in the apron and automatic means provided for moving the apron in a sweeping path to pick up objects in front of the vehicle.

Storage Battery, Orlando Oldham, Denton, near Manchester, England. A storage battery comprising a cell having a cover member, a gas collecting chamber in the latter and a tube having an exit opening in the bottom of the cell, extending to and into the collecting chamber and accessible to the gases which are formed within the cell.

Tire Mounting Tool, Benjamin Dahl, Minneapolis, Minn. A clamp device having a screw bolt member for attaching punctureless tires.

Tire Grip, Richard A. Breul, Bridgeport, Conn. A tire grip formed of chains, the main members being fitted in the form of a square. The traction members are attached to the main members and extend across the tread of the shoe.

Lever Locking Device, William J. Riddell, Pittsburg, Penn. The gear shift levers of the car are locked in a neutral position by means of an arm registering in slots, thereby preventing the moving of the lever member.

Shock Absorbing Device, Charles S. Moore, Danvers, Mass. The device is adaptable to springs of the elliptical design. The absorber is bow shaped, curled in the centre, and the lower portion is secured to the spring clip. The upper end is free to slide between two rollers mounted on a bracket on the underside of the top frame member.

Automobile Bumper, John and Albert Henry Hanna, Troy, N. Y., assignor to John P. Randerson, Albany, N. Y. A plate is secured to the frame of the machine and a second member is rotably attached; also an arm. Sliding connections are provided between the arm and plate and the former carries a bar. Means are provided for manually releasing the second plate as well as automatic means for locking the same when it is returned to normal engagement.

Gas Engine Attachment, Lambert J. Bordo, Hillside, Penn. A priming cup device having a valve mechanism permitting the introduction of fluids and for closing the aperture.

Throttle Controller, James J. Quigley, Mamaroneck, N. Y. A form of accelerator pedal is utilized to actuate the throttle of the carburetor and a dash pot is pivoted to a fixed support and means for pivotally connecting the piston rod of the dash pot to the accelerator member.

Traction Wheel, Kenneth N. Avery, Covina, Cal. A wheel comprising a drum, a rim portion outside same, a series of tangential springs carried by said drum and having ground engaging points at their free ends.

Electrolytic Cell, Frank H. Briggs, Elyria, O. The combination of an electrolyte container and electrodes, of an electrolytic cell, of a fixed support normally extending within the container, a cover and heating elements carried by said support, and means for removing the container without disturbing other parts.

Governor, Norman T. Harrington, Lansing, Mich. A governor for an explosive motor. The combination comprises a periodically opening admission valve, of a continuously moving oscillating valve controlling the same conduit having an instantaneous closure at the centre of its oscillation, and means for varying the amplitude of oscillation.

Traction Wheel, Walter S. Morton, Harrisburg, Penn. The rim is composed of two angle irons each connected with the outer extremities of one series of spokes and a tread made up of a series of three-legged members having outstanding ribs along their outer faces.

Vehicle Body, Frederick A. Brand, assignor to the Broc Electric Vehicle Company, Cleveland, O. In a coupe vehicle body having a window therein, the combination of a seat disposed below said window; a fixed back for said seat, said back extending to a point below the level of window sill, and a vertically movable supplementary back adapted in its lower position to rest upon fixed back and to extend therefrom to the level of the window sill.

Motorcycle Saddle, Frederick Mesigner, New York City. A saddle provided with a post clamp, a pair of arms extending laterally therefrom and having seats at their outer ends, a pair of flat cradle springs engaging said seats at their forward ends, bolts passing through said springs and arms, a saddle top and means for securing the rear ends of springs to said top.

Spring Wheel, Walter Hill, Mattoon, Ill. Between the solid shoe and rim of the wheel are fitted U shaped springs arranged transversely, and secured to a plate carrying the tire and to the rim of the wheel by a bolt and clamp device.

Cranking Device, Peter Christensen, Kingsville, Tex. A starting device comprising a clutch, a toothed sleeve slidably mounted in said clutch and adapted to be mounted upon an engine shaft, a pawl pivotally mounted upon said clutch and adapted to engage said teeth, means carried by said pawl for limiting the inward movement of said pawl, and an operating mechanism for moving said clutch to bring pawl into and out of engagement with said teeth.

MILLIONS FOR TIRE REPAIRS.

Figures Which Indicate Growth of This Business—What Capital Is Required.

During the coming year at least $40,000,000 will be spent by American automobile owners for tire repairs, according to the Williams Foundry & Machine Company, Akron, O., which has made a study of this branch of the industry. This estimate is based upon the announcement that there are 900,000 motor cars in use today and that 600,000 are to be built for 1913. It is assumed that 200,000 of the machines now in use will be scrapped, leaving 1,300,000 to wear out tires.

Tire makers say that each machine consumes an average of six outer casings and nine inner tubes a year. If this be cut to five casings and seven tubes, a total of 6,500,000 casings and 9,100,000 tubes will be used in 1913. It is claimed that at least $5 a casing and $1 an inner tube will be expended for repairs, making a total of $41,600,000.

It is conceded that tire upkeep is the heaviest item in motor vehicle operating expense. Good tires cost money and the best often are subject to blow-outs, due to under-inflation, rim cutting, punctures and the many severe strains caused by carrying loads at high speeds over rough American roads. Fortunately the motorist can have these damaged tires repaired, so as to give much additional mileage at a low cost, and the business of tire repairing has grown to be one of importance.

Thousands of men who have learned to repair tires by working for a few months in a tire factory or repair shop, have purchased equipment and started in business for themselves to find that few lines offer as prompt or as large returns for the needed experience and capital. The repair equipment manufacturers, in the front rank of which must be included the Williams company, have kept pace with the industry and offer a line of appliances that enable the repairman anywhere to do work on damaged tires as satisfactorily as that done by the tire maker.

An investment of $50 will buy the tools and a steam vulcanizer that will cure inner tube and all minor repairs to casings, a work that can be undertaken by the ordinary mechanic without special training. Two hundred dollars will fit out a small plant that not only will take care of all inner tube work, but the most serious casing repairs. The equipment for a plant doing a business of $25,000 a year need not cost more than $1000, and it will last indefinitely. It need not be added that the appliances should be purchased of a reliable maker with long experience.

Many garages, repair stations and general repair shops are making good money out of tire repairing as a side line. Of course where there are many automobiles there are independent shops doing a large business in nothing but tire repairs. As each 100 machines can be counted upon to produce $3500 worth of such work a year, it will be seen that even a small community can offer good returns to a tire repair shop.

The Williams Foundry & Machine Company publishes some interesting literature upon this subject, which will be mailed free upon application. When it is known that the average job will pay 50 per cent. profit, it would appear that the subject was one with which the repairman should become familiar. It has been proven that a repair shop employing one man and having not over $500 invested will often earn a larger profit than a machine shop with an investment of $5000 and five mechanics.

NO BOSCH EXHIBIT AT SHOWS.

Well Known Magneto Manufacturer Will Display at Own Headquarters.

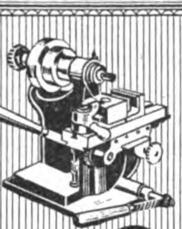
For the first time since 1909, the Bosch Magneto Company, New York City, maker of Bosch magnetos and plugs, will not be represented at either the New York or Chicago show. This decision was reached early in the month and cancellation of the spaces allotted to the company by the Motor & Accessory Manufacturers followed almost immediately. It is explained that this move was made necessary by the fact that the spaces assigned were found to be entirely too small for a proper display of the company's products, which include over 200 types. In lieu of representation at the shows, special displays will be arranged at the offices of the company during the progress of the exhibitions. The New York Bosch exhibit will be found at the main office, 223-225 West 46th street, and that at Chicago, in the local branch on 24th street near Michigan avenue. Manufacturers and others are invited to visit these displays and obtain full information concerning Bosch ignition, ample room being provided for a special investigation of the entire subject.

PLANNING FOR PROVIDENCE DISPLAY.

Rhode Island's Second Annual Show to Be Held Early the Coming Year.

Following the plan adopted by the Rhode Island Automobile Dealers' Association, Providence, R. I., last year, the annual Providence show will be held in the state armory, Cranston and Parade streets, Jan. 25-Feb. 1, immediately following the commercial vehicle display in New York City. The management will be the same as in 1912, and all applications for space should be made to Arthur S. Lee, 52 Richmond street.

Thirty-eight thousand square feet of floor space is available for the exhibition of pleasure and commercial cars and accessories, and present indications would seem to insure that it all will be filled. The interior of the armory lends itself admirably to a special decorative scheme, and it may be stated that the treatment will be quite as striking as that of a year ago.



Up-To-Date Shop & Garage Equipment

WESTERN ROADWAY FILLING OUTFIT.

There is profit to be derived in the sale of gasoline if the equipment for handling it is such that little time is lost by the attendant in supplying the needs of the customer. When the tank is located within the garage and the fluid has to be drawn in five-gallon lots and carried out to the car, considerable time is lost in the operation. Sometimes it is necessary to search for a funnel to fit the opening of the car's tank.

The Western Oil Pump & Tank Company, St. Louis, Mo., is marketing an equipment known as the roadway filling outfit, illustrated at Fig. 1, the views depicting the device closed and open.

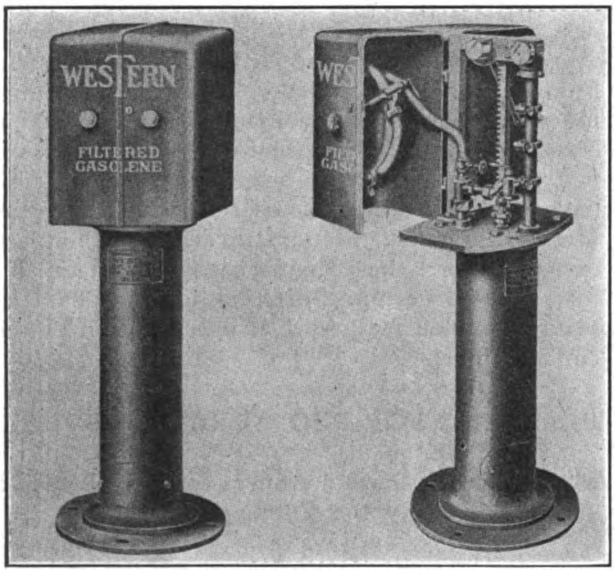


Fig. 1—The Western Roadway Filling Equipment: At Left, Showing Doors Closed; at Right, the Pump Ready for Service.

It is designed for bolting to the sidewalk near the curb and the pumping apparatus is enclosed by a cabinet mounted upon a hollow metal column. The cabinet is constructed of a heavy gray cast iron and all bolts and connections are inside, preventing the possibility of tampering.

The double doors are hinged and swing backward, permitting of easy access to the mechanism, overlap when closed, and are fitted with a Yale lock. A two-way nozzle is attached to six feet of steel lined hose, permitting use of the hose when the tank of a car is to be filled as well as with the usual five-gallon can. A swivel coupling allows the nozzles to be turned to either side and they may be utilized independently of each other, or both may be in use at the same time.

Special provision is made for separating all water and foreign elements from the gasoline. A gravity filter is connected to the base of the cylinder and is made an integral part of the pump. All impurities are collected in a chamber which is accessible through a small door. Means for draining are provided.

The pump is of the long distance type, measuring gallons, half-gallons, quarts or pints at one stroke of the handle. All parts are constructed of high grade material. The pump is equipped with a meter that keeps an accurate account of all fuel drawn up to 10,000 gallons, at which point it reverts to zero. Every tenth of a gallon drawn is denoted. The pump and cabinet are finished in vermilion enamel with nickel trimmings. The height is 52 inches.

WILLIAMS TIRE REBUILDING STAND.

With proper equipment the work of repairing tires is greatly facilitated. The Williams Foundry & Machine Company, Akron, O., maker of tire repairing equipment, is manufacturing a tire rebuilding stand which is a great saver of time in that the shoe to be repaired may be quickly mounted and easily handled during the operation.

As will be noted by the illustration presented at Fig. 2 the device comprises a regular clincher rim upon which the tire to be repaired is mounted. It may be secured in this manner or on one of the company's regular retreading rims with a coil inside the casing, or with the special reliner building form.

When the retreading rims and coils are utilized the old tread may be torn off and the carcass roughed, the new tread applied, rolled down, and the wrapper applied without removing the casing from the stand. The tread rolling attachment includes five tread rollers, the one fitting the tire being placed upon the spindle. The levers are so arranged that the rollers will swing down below the tread on each side. They are pressed against the tread when the tire is revolved by hand.

The casing may be adjusted to any angle. Pressing upon the pedal releases the ratchet flange at the end of the spider shaft so that the

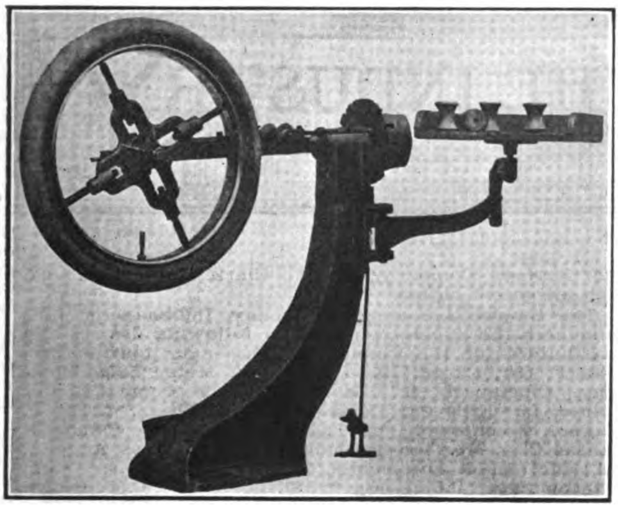


Fig. 2—The Williams Tire Building Stand, Making for Convenience in Repairing Shoes.

shoe may be swung to the desired position. Releasing the pedal locks the tire. A reversible ratchet attached to the spider permits the tire to be revolved in either direction or locked. The table is adjustable and may be swung to either side of the stand and a feature of it is that the required tools are always accessible, a quality making for economy in that time is saved. The stand is constructed of high grade material.

THE AUTOMATIC VALVE GRINDER.

One of the most common tasks in the repair shop is the grinding in of the valves on the gasoline motor. It is work that cannot be rushed as the valves must be ground until a good seat is secured, else the time is wasted. Formerly the operation was performed by hand utilizing a screw driver or a bit stock, but the progressive garage now employs a tool specially designed for the work.

One of the difficulties makers of these devices have had to overcome is to design the tool so that it will not only impart a reciprocating motion, but lift the valve from its seat in the cylinder at stated intervals. With the bit stock or screw driver this is accomplished by placing a spring under the head of the valve.

An automatic valve grinder, which was patterned after the operation of the ordinary carpenter's breast drill, is the invention of R. H. Hazeltine of New York City, and is manufactured by the Specialty Machine Company of 94 Liberty street, of that city. The device, two views of which are presented at Fig. 3, consists of an oscillating arm, a bevel pinion, a driving rod for the valve and two plain gears with a turning crank; also a cam, roller, clutch and spring.

Its construction is best outlined by its operation in service. When the handle A is rotated the crank B revolves in the slot C, imparting a reciprocating motion to the arm and segment D, which also reciprocates the small pinion E, the clutch I transmitting this movement to the driving spindle E. The gear G is driven by the small pinion K. Located on the inside of larger gear is a cam which periodically comes under a roller mounted upon the carrier L, and lifts the clutch I from engagement, but holding it until the pinion E has rotated through a given arc, whereupon the cam drops the clutch back into engagement.

This movement lifts the valve from its seat. A spring M insures the engagement of the clutch at the proper time and supplies the proper pressure. The nut R locks the valve on the rod M. The weight of the tool and the operator's pressure is sustained on the shoulder N and the valve opening on the engine.

The cycle of operations is as follows: First, the valve is reciprocated on its seat for a given number of times, is lifted, released and automatically placed in a different angular position on the seat, then moved forward through a given angle and reciprocated as before.

FREEING FROZEN PISTON RINGS.

In the event of a piston ring becoming frozen in the piston through a lack of lubricant or other inattention, it is sometimes a difficult matter to remove it without breaking the fragile member. A suggestion for completing the work is given in the Commercial Motor, for which the workman was awarded the first prize in a competition.

The piston is removed from the cylinder and connecting rod and placed upon two bricks laid lengthwise and about two inches apart. A gasoline torch is next utilized, playing the flame on the head of the piston until the metal is a blood red heat. The piston is then allowed to cool slightly, and a little kerosene applied to the seized ring. This method is said to result in freeing the ring even if it is carbonized in.

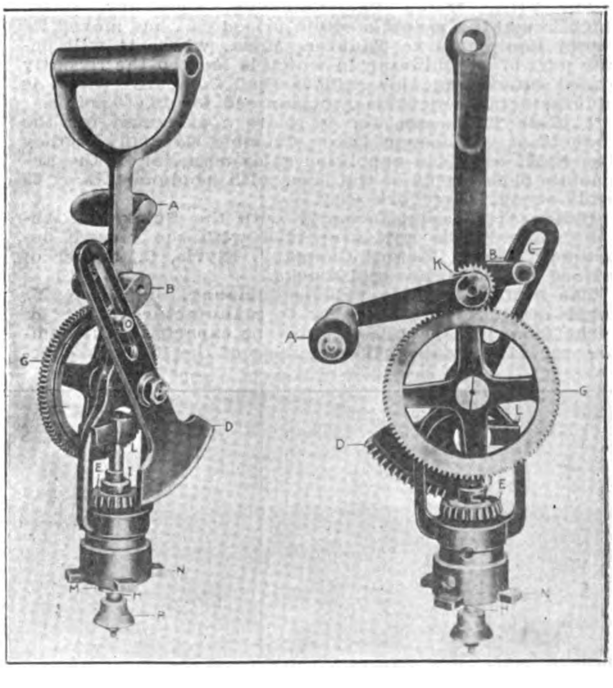


Fig. 3—The Automatic Valve Grinding Tool, a Device Lifting Valve, Also Imparting Reciprocating Movement.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following concerns have been recently incorporated to deal in motor cars, accessories, etc.:

Miller-Brisben Company, Inc., New York City; $25,000; automobiles; incorporators, John McNeill Brisben, Irving Jaffe, Warren A. Miller.

Stegeman Motor Truck Company of New York, Inc., New York City; $25,000; incorporators, John A. Kent, James C. Smith, John G. Anderson.

S. & M. Company, Taunton, Mass.; $5000; garage; incorporators, Frederick A. Shaw, Chester H. Morse, Rachel Morse.

Stats Motor Car Company of New Haven, New Haven, Conn.; $10,000; incorporators, John P. H. Chandler, Edward J. Bartlett, Dana B. Jefferson.

A. W. Cox & Co., Inc., Boston; $10,000; operating and maintaining garages; incorporators, N. B. Todd, Charles B. Baldwin, A. W. Cox.

Elgin Motor Company, Elgin, Ill.; $20,000; to manufacture motors; incorporators, Edward J. O'Beirne, E. G. Adamek, Charles G. Adamek.

Torkington Tire Company of America, Wilmington, Del.; $1,300,000; incorporators, I. Fogg, G. D. Hopkins, G. W. Dillman.

Niagara Motors & Manufacturing Company, Dunkirk, N. Y.; $275,000; to manufacture motors and parts; incorporators, Edward J. West, Morris M. Hedden, Daniel W. Frey.

Chandler Engine Valve Company, Chicago; $60,000; incorporators, G. A. Critton, N. B. Dearborn, E. S. Hoskin.

Knight Motor Car Company, San Antonio, Tex.; $10,000; to deal in motor cars; incorporators, H. L. Knight, A. H. Danforth, A. H. Elmore.

Anderson Electric Car Company, Boston; $10,000; to deal in motor cars; incorporators, Albert Weatherby, Frank R. Keith, Alonzo E. Yont.

WITH THE MANUFACTURER

The Ultra Motor Car Company, Amesbury, Mass., which is making a new medium priced car, has moved its factory equipment to Taunton, Mass., where it will occupy part of the building in which is located the recently formed Interchangeable Rubber Heel Company, which is manufacturing a new tire, guaranteed for 10,000 miles.

A. Gale Thompson, for 16 years a salesman for the products of the Joseph Dixon Crucible Company, Jersey City, N. J., has been appointed sales manager of the automobile department of the firm, with headquarters at 68 Reade street, New York City.

Henry A. Wagner, formerly with the Buick and Abbott companies, is now connected with the service department of the Garford Company, Elyria, O., maker of Garford pleasure cars and trucks.

The Buffalo Electric Vehicle Company, Buffalo, N. Y., maker of Buffalo electrics, is to manufacture a line of trucks from 1000 pounds to two tons capacity. The company recently acquired the interests of the Babcock Electric Carriage Company and the Clark Motor Company, with all patent rights.

The Empire Automobile Company, Indianapolis, Ind., announces the appointment of the following dealers and distributors for the Empire five-passenger touring car: John F. Orr, Carmi, Ill.; Commercial Motor Sales Company, Cincinnati, O.; Cartercar Iowa Company, Des Moines, Ia.; Ellis Car Company, Greenville, S. C.; H. F. Wagner, Greentown, Ind.; England Bros. Motor Company, Kansas City, Mo.; Greer Robbins Company, Los Angeles, Cal.; McDonald Automobile Company, Memphis, Tenn.; Johnson Automobile Company, St. Louis, Mo.; C. F. Brown Automobile Company, Shreveport, La.; Crist Motor Sales Company, Toledo, O.; Peru Can Zandy Implement Company, Wichita, Kan.; C. J. Reeve, Cleveland, O.; Sherman Bradley, Corning, Ia.; Somerset Automobile Company, Somerset, Penn.; Cumberland Valley Garage, Carlisle, Penn.; Galion Motor Car Company, Galion, O.; Haines Bros., Quincy, O.; W. S. Woodring, LeCarne, O.; Columbus Automobile Company, Columbus, Neb.; W. H. May, Pompton Plains, N. J.; R. W. Taylor, Mokane, Mo.; Silas Lieb, Pender, Neb.; Schoepp & Karch, Mascoutah, Ill.; W. G. Hunt, Brighton, Ill.

The Kissel Motor Car Company, Hartford, Wis., maker of KisselKar pleasure cars and trucks, has established a large service station at 1030 Commonwealth avenue, Boston, with Manager Pruden of the New England branch in charge. The building is of reinforced concrete and is two stories high. The second floor is used for the truck department, the pleasure car salesrooms being on the ground floor. A large turntable is provided for the handling of the large trucks. The rear of the second floor has the repair shop, which is thoroughly equipped, including electrical machines of all modern kinds to facilitate the repair of pleasure and commercial vehicles.

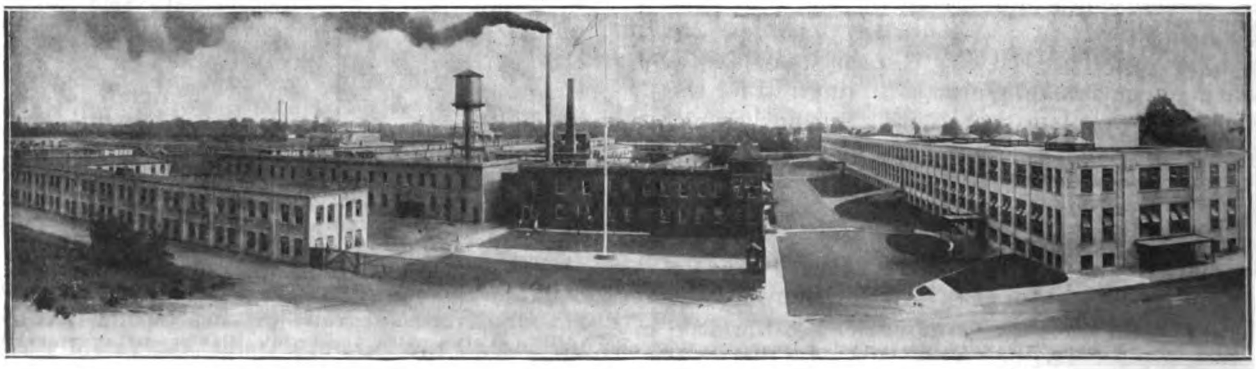
Gerald Fitzgerald, who has for some time been assistant manager of the Chicago branch of the Remy Electric Company, will assume the position of manager of the factory branch to be opened at Minneapolis, Minn. M. C. Kent, also of Chicago, will be assistant manager.

Cyril J. Atkinson, M. E., inventor and patentee of the Atkinson gas producer and a number of special devices pertaining to gas producers, has severed his connection with the Dornfield-Kunert Company of Watertown, Wis. Mr. Atkinson's services and the use of all his patents have been secured by Fairbanks, Morse & Co., Chicago, maker of all kinds of motors, and a number of Mr. Atkinson's valuable patents will be incorporated in the Fairbanks-Morse gas producers at once.

W. Krafve has joined the sales force of the H. J. Koehler Sporting Goods Company, New York City, distributor of the Koehler commercial car. Mr. Krafve for a number of years handled the Cadillac and Buick cars in New England territory and his friends will, no doubt, be interested in learning of his new connection.

The Reo Motor Car Company, Lansing, Mich., maker of Reo cars, has recently completed its new three-story shipping and assembly plant, 252 by 252 feet, providing 190,512 additional square feet of floor space with a capacity of 1600 cars. The floors are of cement, and the structure is fitted throughout with an effective automatic sprinkling system. A feature in connection with this plant is the special overhead runway leading to the main factory.

H. L. Shepler, general superintendent of the Willys-Overland industries, of Toledo, O., has gone to Europe



Bird's-Eye View of the Olds Motor Works Plant in Lansing, Mich., Where Oldsmobile Cars Are Produced.

for two months, during which time he will pay particular attention to the foreign motor car industry, especially as related to the question of proposed production of high-grade cars at low prices which is being agitated in England and Germany at present.

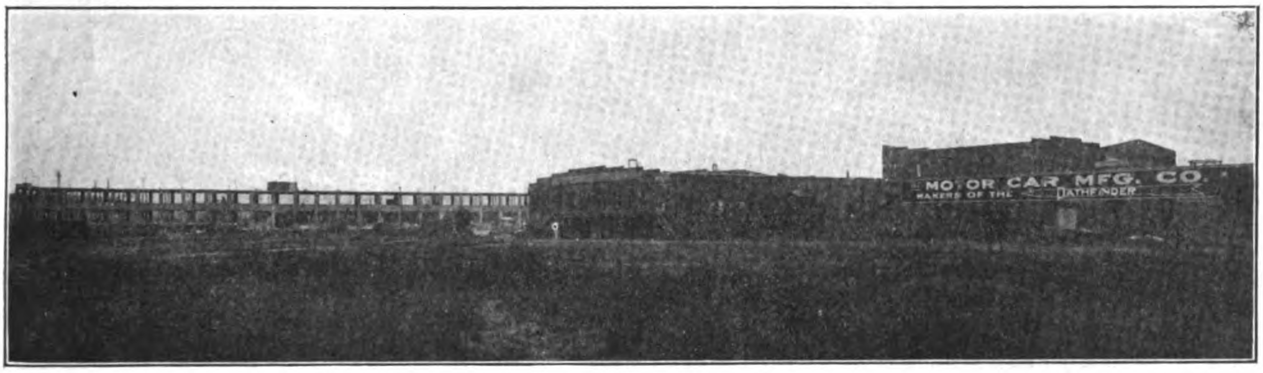
The Globe Seamless Tube Company is seeking a location for a factory in Detroit. The plant when in operation will give employment to a large number of men.

F. W. Kurtz, who has just completed his work with the General Motors Company, Detroit, having been the director of advertising since May, 1911, and having perfected an organization whereby each subsidiary company now has its own efficient advertising department, has returned to Philadelphia, where he has resumed his connection with the well known advertising firm of N. W. Ayer & Son, with which house he had been associated for 12 years previous to his removal to Detroit. Mr. Kurtz's knowledge of advertising, acquired through his long agency experience, was particularly valuable in the special character of work that he did for the General Motors Company.

J. B. Maus, formerly district manager of the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, and William Ellenbeck, Jr., manager of the Brooklyn branch of the same company, who recently resigned, are now associated with the main office of the United States Tire Company, Broadway and 58th street, New York City.

H. G. Salisbury, general manager of the California territory of the Motor Car Manufacturing Company, Indianapolis, Ind., maker of the Pathfinder 40, has announced the appointment of Barry Cool, a well known automobile man of Los Angeles, Cal., as manager of the northern branch.

The Henderson Motor Car Company, Indianapolis, Ind., has appointed the following new agents for Henderson cars: American Motor Sales Company, Toronto, Can.; The Henderson Motor Sales Company, Baltimore, Md.; Howard D. Graves, Hartford, Conn.; Knowles & Collins, New Haven, Conn.; George O. Franklin, Pulaski, Fla.; F. D. Aiken's Sons, Brunswick, Ga.; Cummins Motor Car Company, Harrisburg, Ill.; Ajax Motor Sales Company, Springfield, Ill.; J. I. Johnson, Palmer, Ia.; James N. Kemp Machine Works, Albany, N. Y.; Earl Knickerbocker, Binghamton, N. Y.; H. L. Mann, Portland, Ore.; G. C. Brenner, Mechanicsburg, Penn.; T. H. Sutherland, Washington, Penn.; J. B. Higginson, Providence, R. I.



General View of the New Addition to the Factory of the Motor Car Manufacturing Company, Indianapolis, Ind.

The Nichoalds Company, Detroit, heretofore engaged in the manufacture of automobile parts, has taken up, in addition, the production of automobile chassis for the trade.

Smalley Daniels, formerly of Boston and now with headquarters in Detroit, who has specialized in metal boxes among other automobile equipment, has become financially interested in a new box factory at Cleveland, O., under the style of G. F. Mitchell & Son., and will act as sales manager. The concern also will produce a line of funnels, measures, mufflers and drip pans.

John G. Perrin, chief engineer of the Lozier Motor Company, Detroit, maker of Lozier cars, who was recently elected vice president of the Society of Automobile Engineers, has gone to Europe to study the trend of design of the foreign motor car industry and to compare the progress made by foreign manufacturers with that of the makers in this country He will visit many of the best English factories.

Morton H. Luce, who has been associated with the Velie interests in the Boston and Chicago branches for the past four years, has resigned to accept a position with the Marion Motor Car Company, Indianapolis, Ind., maker of Marion cars. He will be located in New York City, taking charge of the eastern district.

The Luverne Automobile Company, Luverne, Minn., has added a four-cylinder, 40 horsepower car to its line of six-cylinder pleasure machines. The company sells direct from the factory only.

GARAGE & DEALER

Jay Livingston and Will L. Crosson have taken possession of the garage at 407 West Second street, Hastings, Neb., formerly conducted by Hiatt & Reader. The new firm will be known as Livingston & Crosson.

John Preston has purchased the Fannin County Garage, located in the World building, Bonham, Tex., of H. Seay and Gern Everheart.

Charles M. King & Son, Sacramento, Cal., located at 1229 Seventh and M streets, has decided to devote its time exclusively to selling of the Gramm motor truck in northern California.

The Jackson Motor Car Company, Nashville, Tenn., has been formed with a capital of $5000, the stockholders being H. C. Gillespie, D. D. Canfield, E. L. Bowne, W. H. Weakley and W. C. Sandifeur. The company has purchased the property of the Volunteer Motor Car Company at 526 Broad street, which is being enlarged for the new business.

The Park Motors Company, 241 West Fourth avenue, Columbus, O., has opened one of the most complete garages and repair shops in the city, to be known as the Neil-Fourth garage. Charles Parkinson and S. Van Etten are in charge. The company will buy and sell used cars and special attention will be given to the rebuilding of old cars. An electric charging station of the latest type has been installed and later the company expects to build cars of its own design.

The Electric Manufacturing Company, 353-355 Minnesota street, St. Paul, Minn., of which L. J. Shields is manager, has secured the services of A. R. Burr and J. E. Olen, former secretary-treasurer and vice president, respectively, of the C. J. Smith Company, and as a result of this amalgamation the company has increased its capital by $50,000 and has added to its big stock of automobile and motorcycle supplies. A new building on West Sixth street will be built in the near future, the contract having been awarded.

F. W. Ramm, proprietor of a garage at St. Petersburg, Fla., which bears his name, has decided to incorporate in order that a larger and more complete establishment can be maintained to care for increasing business. The capital will be $100,000 and many of the leading business men of the South have subscribed for stock.

Dillon Court Garage, at the rear of Dillon Court Hotel, Hartford, Conn., is the latest addition to that city's automobile establishments. Yetter & Morse have the management. The garage is large and modern and in addition to a first class repair department a line of automobile accessories is carried.

Fred Barnum, Waterbury, Conn., has sold his garage at 52 South Main street to Richardson Bros., who will conduct a similar establishment at 70 South Main street. The purchasers state that for the present both plants will be operated.

The Universal Motor Truck Company, Cleveland, O., is a strong addition to the automobile houses of that city. The sales and service departments are located at 2352 Euclid avenue. C. W. Moody is general manager and M. J. O'Connor and J. A. Boyd will have charge of the sales department.

Lamb-Daniel & Co., which has opened offices at 712-718 Union Trust building, Detroit, for the purpose of representing manufacturers of automobile parts and accessories, has started its career with a splendid business. Mr. Daniel was formerly connected with the sales department of the Cartercar Company, maker of Cartercars, and previous to that with the Castle Lamp Company, Battle Creek, Mich. Mr. Lamb was formerly manager of the Franklin Company. Lamb-Daniel & Co. will handle a complete line of automobile accessories.

W. K. Hurd and A. K. McRae of the Florence Auto

Company, Florence, Col., have purchased the business of the Sunville Auto Company and the Overland Auto Company of Pueblo, Col., and will in future devote their attention to the sale of Ford cars, made by the Ford Motor Company, Detroit. The firm will be known as the Arkansas Valley Auto Company and will be located at Sixth and Court streets, Pueblo. Mr. McRae will have charge of the business, while Mr. Hurd will look after the interests of the firm at Florence.

Charles Pendleton, Keota, Ia., has purchased the garage formerly owned by Chester Stewart, for $5750. He is building an addition at the rear, in which he will install a completely equipped repair shop which will have lathe, drill press, milling machine and planer. A high pressure boiler will heat the building and also provide heat for the vulcanizing plant.

City Hall Garage Company, Inc., Paterson, N. J., of which Bernard Katz is proprietor, is to have a large addition, doubling its floor space, and costing $4000. The building now covers 25-29 Union street.

C. E. Miller of Cordele, Ga., has purchased the garage of Dr. A. B. McQueen at Tarpon, Fla.

C. W. Maxim, manager of the Middleboro Auto Exchange, Middleboro, Mass., New England distributor for the McFarlan car, announces the appointment of L. H. Roberts as director of wholesale sales. Mr. Roberts formerly held a similar position with the Studebaker Boston branch, and before that was connected with the Marmon and Lozier forces in various sections of the country. This arrangement leaves C. W. Maxim free to devote his entire attention to the service department. E. L. Maxim retains his position as advertising and publicity manager.

The Southwestern Motor Sales Company, Dallas, Tex., has been formed with a capital of $200,000. L. A. Boll, Jr., is president and associated with him are the following: Vice presidents, C. Charles Jones and Martin A. Seward; secretary, W. L. Marsh, treasurer, N. E. Jones. The firm is located at 1608 Commerce street and will represent the Lozier, Speedwell, Staver, Little and Chevrolet automobiles and the Staver and Speedwell trucks. C. R. Jones will have charge of the truck department.

James Morris, who recently withdrew from the management of the Chalmers repair shop of the Union Supply Company, Toledo, O., has entered business for himself at 109-111 Eleventh street. His plant is equipped for all kinds of repair work.

The Michigan-Georgia Motor Company, Atlanta, Ga., has begun business under auspicious circumstances as agent for the Michigan machines, made by the Michigan Motor Car Company, Kalamazoo, Mich. John D. Wells is president and H. C. Tuggle is vice president. R. M. Northcutt has charge of the sales department and has associated with him many salesmen well known in the automobile field.

The Warsaw Auto Company, Warsaw, Ind., has been incorporated by Allae S. Widaman, Walter Stanley and John E. Armstrong. The new company will operate the Stanley & Armstrong garage at Leesburg, Ind., and the Widaman garage at Warsaw and will act as agent for the Studebaker, Hudson and Overland lines.

G. R. Dillon and Max Wolcott have formed a partnership and will conduct a general automobile business at the garage at Tioga avenue and Pine street, Corning, N. Y. Both men are experienced in the automobile trade.

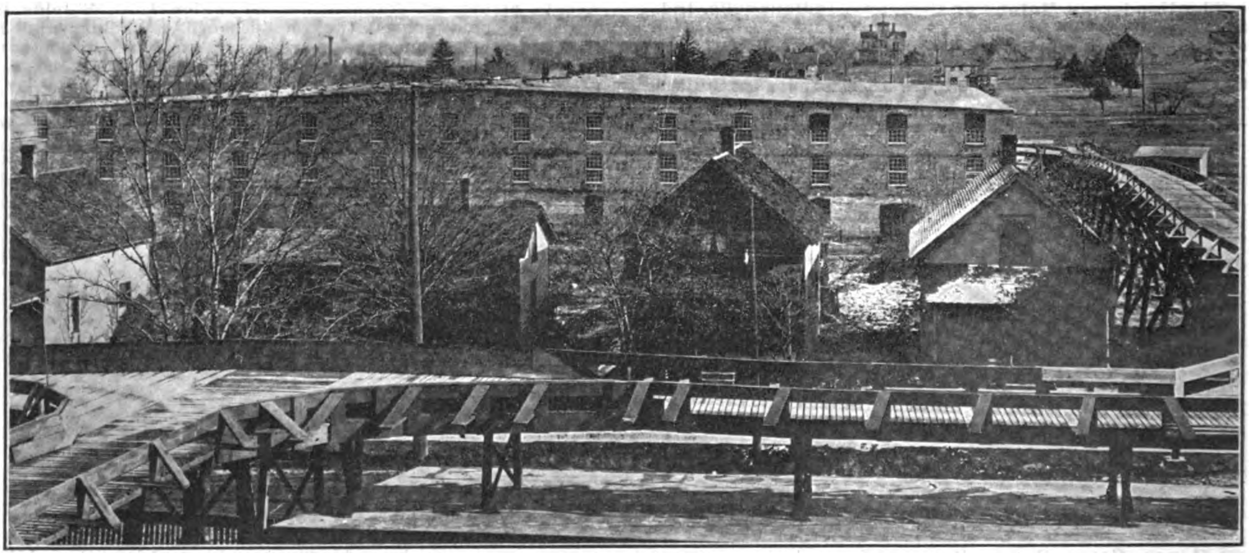
The Michigan Motor Company, Washington, D. C., has been incorporated to handle the product of the Michigan Motor Car Company, Kalamazoo, Mich. The officers of the company are: President, T. Oliver Probey; vice president, J. H. Stuart; secretary and treasurer, George R. Stuart; sales manager, F. C. Sibbald; service department superintendent, E. G. Powell. Salesrooms and a service station have been established at 1230 Wisconsin avenue.

The Dupont Garage Company, Washington, D. C., is a newly organized selling company of which Raymond A. Klock, formerly senior salesman of the United Motor Washington Company, is sales manager. J. E. Connelly, general manager of the Dupont Garage Company, will supervise the business of the new concern. E. W. White, who has been identified with the Hudson interests at Washington, will assist Mr. Klock in the sales department. This branch will be located at 1321 14th street, northwest, and arrangements have been made for prompt and efficient service to Columbia, Hudson and Hupp-Yeats owners at the service station of the Dupont Garage Company, 2020 M street, northwest.

The Petty-Calhoun Company, Macon, Ga., has been dissolved and its garage discontinued. Mr. Petty has retired from the business and R. L. Knight and C. F. Calhoun, the other members of the firm, have merged their interests with the Macon Auto Company, 519 Poplar street.

The Barlow Garage Company, Newark, N. J., recently organized to maintain and repair electric pleasure and commercial vehicles, which at present is operating in the old Lansden factory at 233-235 High street, has leased the building now being erected at 133-135 Washington street. When completed the garage, which is a two-story fireproof structure, will have facilities for charging 60 vehicles daily.

William Pratt, Riverside, Cal., is in charge of a new salesroom and garage at 446-448 Eighth street, in which also will be located the newly acquired agency for Ford cars, made by the Ford Motor Company, Detroit.



New Three-Story Shipping and Assembly Plant of Reo Motor Car Company, Lansing, Mich., and Runway Connecting It with Main Factory.

Lutz & Weaver, Ashland, Ky., has established a new automobile garage on Front avenue. They will handle the Buick cars, made by the Buick Motor Company, Flint, Mich.

The Adirondack Motor Company, Hudson Falls, N. Y., has purchased land at 188 Main street as a site for a new, modern garage. The company distributes Overland machines and maintains branches at Albany, Troy and Saratoga.

William J. Miller and **R. M. Weaver,** who recently purchased the Broad-Oak automobile garage, Columbus, O., have extended the business, securing an additional floor in the building, which has been converted into one of the most completely equipped repair shops in the state. Mr. Miller, former builder of the Frayer-Miller engines, is in personal charge of the repair department.

H. A. Storer, Cambridge, Mass., will erect a new brick garage on West street. He has made application to the city for a permit to erect the building.

Van Winkle Bros. & Weister, San Fernando, Cal., has erected a fine new garage. The company is agent for the Studebaker cars, made by the Studebaker Corporation, Detroit.

The Southern Garage has purchased the store of the Central Auto Company on 13th street and the stock will be moved to garage on Chester avenue, Bakersfield, Cal.

W. S. Sandeman, proprietor of "Sandy's auto garage," 57 Boylston street, Cambridge, Mass., has doubled the floor space of his fireproof building. The garage now has a total floor space of over 7000 square feet. There is a large machine shop, an office and workshop, where a specialty is made of ignition and carburetion repairs.

NEWS NOTES OF THE INDUSTRY.

(Too Late for Classification in Previous Pages.)

The following concerns have been recently incorporated to deal in motor cars, accessories, etc.:

Eastern Motor Car Company, Los Angeles, Cal.; $25,000; incorporators, G. R. Jones, C. Greenberg, A. Murphy.

Usher Automobile Stop Company, Chicopee, Mass.; $15,000; incorporators, Frank H. Page, Frank D. Howard.

Broadway Garage Company, Barnesville, Minn.; $4000; incorporators, George J. Dahm, John A. Cramer.

Flex-O-Fill Core Company, New York City; $50,000; to deal in compound for filling tires; incorporators, Mark A. Noble and others.

Northern Ohio Motor Company, Cleveland, O., $25,000; dealing in automobiles; incorporators, Herbert W. Bell, E. L. Bennings, F. C. Anselm, E. P. Eirich, C. L. Guthrie.

Slattery Bros. Automobile Company, Worcester, Mass.; $10,000; incorporators, William J. Slattery, John McCoy Slattery, Mary J. McCoy.

Lakeside Motor Truck Transportation Company, Chicago; $25,000; motor transportation; incorporators, B. P. Dunlap, J. M. Dunlap, E. W. MacAvoy.

Storm Shield Manufacturing Company, Chicago, $100,000; to manufacture automobile accessories; incorporators, L. E. Street, R. E. Wighton, N. P. Street.

Joseph U. Bender, Inc., New York City.; $10,000; to deal in automobiles, etc.; incorporators, Elizabeth Bender and others.

American Commer Truck, Inc., New York City; $10,000; to manufacture motor trucks, machinery, etc.; incorporators, Raymond C. Thompson, Julius Kahan, Edward C. O. Thompson.

Kells Motor Radiator Corporation, New York City; $650,000; to manufacture and deal in motor radiators; incorporators, Henry R. Bingham, Alexander F. Carbe, Cornelius A. Cole.

Motor Mechanism Company, Cleveland, O., $25,000; to manufacture automobiles and automobile parts; incorporators, Edward Younger, Florence Castle, Herbert C. Evans, H. E. Gray, S. E. Sackerman.

Auto Mart Company, Cleveland, O.; $10,000; to deal in and let for hire, automobiles, motorcycles, etc.; incorporators, Edward C. Plietz, W. G. Radcliffe, William H. Haselman, M. R. Wallace, Louis C. Heinberger.

Rose City Auto Company, Newcastle, Ind.; $10,000; incorporators, Frank E. Smith, Charles W. Mouch, William F. Byrket, Howard M. Van Matre, Gordon Cameron, Lawrence W. Bailey, Albert D. Ogborn.

Hall-Miller Auto Company, Cleveland, O.; $5000; to deal in automobiles; incorporators, Joseph A. Freund, Jr.; A. H. Freund, L. D. Greenfield, Charles Kovanda, J. A. Freund.

WITH THE MANUFACTURERS.

Benjamin Briscoe, a director and secretary of the Automobile Board of Trade since its inception, has resigned, owing to his absence in Europe for several months, and the vacancies have been filled by electing John N. Willys of the Willys-Overland Company a director, and Roy D. Chapin of the Hudson Motor Car Company as secretary.

George H. Lloyd, formerly with the Velie Motor Vehicle Company, Moline, Ill., has joined the sales force of the American Motors Company, Indianapolis, Ind.

The Firestone Tire & Rubber Company, Akron, O., maker of Firestone tires and rims, has found it necessary to increase its production facilities. The photograph reproduced herewith was taken during a recent convention of salesmen at the home office of the company and not only shows the new factory building, but the addition which is now being erected.

N. H. Miniter, who for several years has been sales manager of the Stromberg Motor Devices Company, has resigned, and is now associated with the Findeisen & Kropf Manufacturing Company of Chicago, as factory sales manager. He will in future represent the Rayfield carburetor throughout the country.

The Adams Bros. Company, Findlay, O., maker of Adams trucks, recently delivered to the Kittanning fire department of Kittanning, Penn., a combination hose and ambulance wagon. The company also has an order from the city of Olean, N. Y., for chemical fire apparatus.

The Moon Motor Car Company, St. Louis, Mo., maker of Moon cars, has installed a large amount of new machinery in its rear axle department, this being made necessary by the increased demand for its product.

Orin S. Wilson, formerly manager of Studebaker branches at Denver, Col., and Des Moines, Ia., and a veteran in the Studebaker service, has been assigned to the East and South as district representative of the company's sales department. His headquarters will be at Broadway and 59th street, New York City.

The Southern Auto & Equipment Company, Atlanta, Ga., has leased the entire building at 92 South Forsythe street and has taken possession.

The Ford Motor Company, Detroit, maker of Ford cars, has decided to discontinue building a commercial car during the coming season and is now closing out the few machines of this type it has stored in stock.

John H. Mowe, manager of the Detroit branch of the Firestone Tire & Rubber Company, has tendered his resignation, and Howard A. Coffin, formerly of the Warren Motor Car Company, will succeed him.

The Page Auto Hoist Company, located in the plant of the Potato Sorter Company at Madison square, Grand Rapids, Mich., has acquired the site adjacent to the Michigan Hearse & Carriage Company and will build a large factory of brick and steel.

The Ohio Motor Car Company, Cincinnati, O., has been purchased by a company headed by R. E. Northway as president. The name of the concern has been changed to that of Crescent Motor Company and the manufacture of trucks, light delivery wagons and pleasure cars will be continued.

Henry M. Duncan, formerly general manager of the Westchester Appliance Company, New York City, has been appointed supervisor of the eastern district of the United States Motor Company in place of W. F. Smith, resigned. He will have charge of the following selling companies: United Motor Atlanta Company, United Motor Syracuse Company, United Motor Washington Company, United Motor Pittsburg Company and the Keystone Automobile Company of Pittsburg. Mr. Duncan also will act as manager of the United Motor Philadelphia Company.

C. E. Reddig, chief engineer of the Columbia Motor Car Company, Hartford, Conn., and designer of the Columbia car, has resigned his position to become assistant chief engineer of the Timken-Detroit Axle Company, with headquarters at Detroit.

George R. Willman, sales manager of the Warren Motor Car Company, has resigned to become associated with the advertising department of the Studebaker Corporation, Detroit.

The Joseph Dixon Crucible Company, Jersey City, N. J., maker of the Dixon graphite lubricants, etc., announces that the selling price of its silica-graphite "one quality only" paint has been reduced. This is made possible through a decrease in the price of linseed oil which is used as the vehicle. This well known paint has been recognized as standard for nearly 50 years with leading railroads and manufacturing plants, and as giving a long service protection to all exposed steel and metal surfaces. The announcement is in accordance with the firm's policy to give its customers any benefit possible in the reduction of price on materials.

The Bosch Magneto Company, New York City, has appointed the following distributors for Bosch magnetos: Dallas A. Shager & Co., Richmond, Va.; Fry & McGill Motor Supply Company, Denver, Col.; Johnson-Gewinner Company, Atlanta, Ga.; Pence Automobile Company, Minneapolis, Minn.

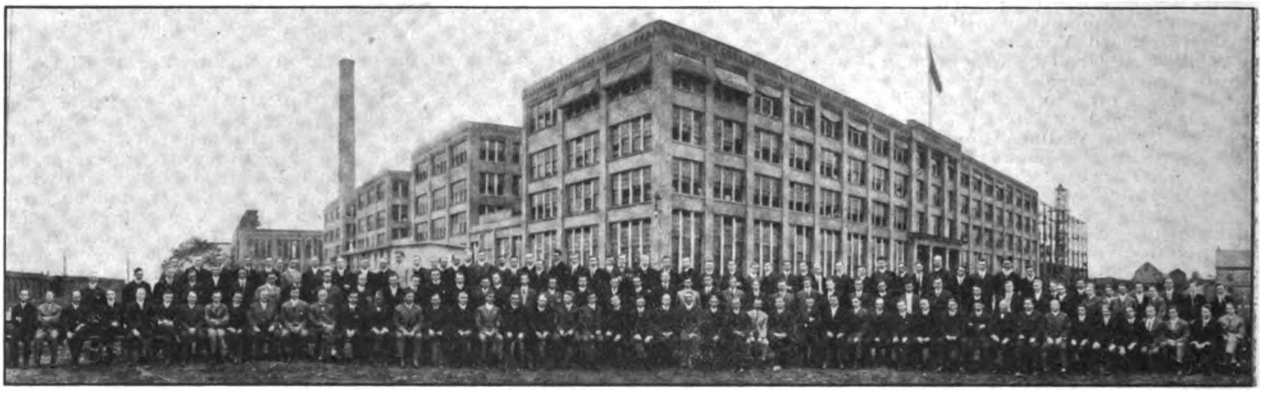
W. A. Buck, a Flanders factory representative, has joined the forces of the E. V. Stratton Company, Inc., Albany, N. Y., distributor for the entire Flanders line for eastern New York, western Massachusetts and Vermont. Mr. Buck is in charge of the Pittsfield branch at Pittsfield, Mass.

B. J. Cline, formerly factory superintendent of the American Motors Company, Indianapolis, Ind., has resigned and has taken a position as general superintendent of the Inter-State Automobile Company, Muncie, Ind., maker of Inter-State machines.

The Empire Automobile Company, Indianapolis, Ind., maker of Empire machines, has appointed the following distributors: Boonville Auto Company, Boonville, Ind.; Ye Motor Shop, Connersville, Ind.; Ralph Temple Automobile Company, Chicago; Wahl Motor Sales Company, Detroit; Jordan-Warneke Motor Car Company, Lewisburg, O.; Oakland Wisconsin Motor Company, Milwaukee, Wis.; Beauchamp & Horton, Mt. Carmel, Ill.; William F. Wagner, Massillon, O.; John R. Opp, Otterbein, Ind.; Williams-Hasley Motor Car Company, Pittsburg, Penn.; H. A. Reese, Severy, Kan.; H. K. Patterson, Timewell, Ill.; W. W. Campbell, Toronto, Can.; C. F. Erb, Youngstown, O.; C. J. Reeve, Cleveland, O.; John J. Gibson Company, Buffalo, N. Y.; Central Machine Works, Sioux City, Ia.; S. W. Schott & Co., Columbus, O.; Yappen & Son, Ashton, Ia.; Stirling Bros., Erie, Penn.; C. R. Baldrige, Braddock, Penn.; C. W. Sahlender, Belleville, Ill.; C. H. Reuber, Schaller, Ia.; Blewitt Auto Company, Ankeny, Ia.; Boone Auto Company, Boone, Ia.; F. B. Glidden Company, Corinth, Ia.; M. B. Pullen, Onawa, Ia.; Moreland Automobile Company, Earlham, Ia.; Bristow Automobile Company, Bristow, Ia.; J. M. Michelwait, Glenwood, Ia.; S. M. & E. R. Painter, Vandergrift, Penn.; Spooner McConnell Motor Car Company, Madison, Wis.; G. E. Eckert, Nevada, O.; Hank Bros., Ottona, O.

The Cole Motor Car Company, Indianapolis, Ind., has appointed distributors for the Cole cars as follows: Central Garage & Machine Shop, Calgary, Alberta, Can.; Boyle & Jaffe, Cheyenne, Wyo.; Columbia Automobile Company, Columbia, Mo.; Cole Sales Company, Dayton, O.; John H. Harris, Durham, N. C.; International Motor Company, Edmonton, Alberta, Can.; W. S. Fleming, Emerald, Wis.; W. T. Hutcheson, Hempstead, N. Y.; Dr. H. C. Miller, Hillside, Mich.; M. E. Reagan, Knightstown, Ind.; Joseph Simon, Lincoln, Neb.; E. M. Elder, Lynnfield, Mass.; Rowlette Auto Company, Maitland, Mo.; J. H. Edwards, Marks, Miss.; G. E. Bowden, Martin, Tenn.; Younger & Progmore, McMinnville, Ore.; Colonial Motor Car Company, Morgantown, W. Va.; H. S. Armstrong, Mt. Auburn, Ill.; H. Evans Sledge, New Bern, N. C.; Newton Motor Car Company, Newton, Ill.; Hearn Auto Company, Pine Bluff, Ark.; Augustus Duryea, Somerville, N. J.; Valentine King garage, Springfield, O.; Motor Truck Company, St. Paul, Minn.; L. Broadfoot and A. J. Manville, Prince Albert, Saskatchewan, Can.; W. L. Simpson, Punxsutawney, Penn.; H. A. Gordon, Regina, Can.; M. Streeter, Tacoma, Wash.; W. J. Hervey, Wellsburg, W. Va.; Corcoran & Foley, York, Neb.

The Marathon Motor Works, Nashville, Tenn., maker of Marathon cars, has appointed the following dealers to handle the sale of Marathon machines during 1918: S. M. Stone, Chicago; Golden Belt Auto Company, Manhattan, Kan.; Manchester Auto Supply Company, Manchester, Mo.; H. E. Carlin, Hickman, Ky.; Arthur Turner & Co., Ltd., London, Eng.; Wichita Marathon Company, Wichita Falls, Tex.; Marathon Motor Sales Company, Memphis, Tenn.; City Garage, Mineral Wells, Tex.; Richardson Orr & Co., New York City; E. P. Kuhl, Gridley, Ill.; Texas Auto Company, Greenville, Tex.; Roeger Bros., Akron, O.; George DeGlopper, Tonawanda, N. Y.; William Fletcher, Eagle Grove, Ia.; J. R. Rardon, Cincinnati, O.; Diffendeffer Buggy & Imp. Co., Springfield, Mo.; D. P. Hart Company, Washington, Penn.; Andalusia Motor Car Company, Goshen, Ala.; Baumgardner & Kibby, Toledo, O.; W. W. Price Auto Company, Wheeling, W. Va.; Blue Ribbon garage, Springfield, Mass.; S. M. Gross, Creston, Ia.; Buckeye Auto Sales Company, Ada, O.; F. L. Massey, Watertown, N. Y.; Buckeye Auto & Repair Company, Canton, O.; Frank Ewright, Conrad, Ia.; J. L. Gooding & Newlin, Kellertown, Ia.; D. W. Pote, Stuart, Ia.; A. R. Hollingsworth, Ellston, Ia.; Charles F. Johnson, Littleton, Mass.; J. R. Croot, Ackley, Ia.; C. P. Lowe & Co., Chapman, Kan.; Thomas W. Parker, Greenville, S. C.; Davis Garage, Danville, Ill.; Frank X. Parker & Co., Portsmouth, Va.; Thomas S. Sedgwick, Knoxville, Tenn.; Peters Bros., Houston, Tex.; Marathon Motor Sales Company, Chicago; George G. McCleary, Mitchellville, Ia.; Brown & Joy, South Farmington, Mass.; Oswald Auto Company, Bay City, Mich.; Thoe-Menzie Auto Company, Belmond, Ia.; W. W. Gibbs, Staunton, Va.; McCondra & Hoeye, Phoenix, Ariz.; F. J. Dragoon, Plattsburg, N. Y.; Fred I. Prew, Clifton, Ill.; B. L. Gintling & Sara K. Gintling, Baltimore, Md.; Edwin Cummins, Durban, South Africa; Gilhousen Bros. Company, Los Angeles, Cal.; Ardery-Halliday Motor Car Company, St. Joseph, Mo.; Fred B. Burton, Janesville, Wis.; Frank S. Dunham, Hutsonville, Ill.; Samuel Hables, San Francisco, Cal.; George E. Bennett, Jr., Fall River, Mass.; Miller & Bloomhart, Beverly, Kan.; Auto Distributing Company, Plainfield, N. J.; B. R. Nowlin, Ames, Ia.; George Parson, Darlington, Wis.; McGovern & McTurk, Traer, Ia.; Blue Ridge Motor Company, Asheville, N. C.; Kauffman & Wise, Van Wert, O.; Harshberger & Jantse, Seward, Neb.; Ketcher & Co., Little Rock, Ark.; Arenz Automobile Company, LaCrosse, Wis.; Miss O. H. Hunter, Shreveport, La.; Todd Auto & Rental Company, St. Louis, Mo.; Enterprise Machine & Garage Company, Franklin, Ky.; Knight Garage, Inc., New Haven, Conn.; Adler Auto Transfer Company, Alexandria, La.; W. P. Kent, Waukee, Ia.; Cozart & Stiman, Clay, Ky.; Ocheyedan Auto Company, Ocheyedan, Ia.; A. F. Workman, Jackson, Miss.; Butler & Berry, Springvale, Minn.; D. B. Turner, Winona, Miss.; Frank H. Hildreth, Longmont, Col.; Kerrigan & Dickman, Minouk, Ill.; W. E. Allen Company, Milwaukee, Wis.; John J. Jungbacker, Jr., Grand Rapids, Mich.; Fetzer & Campbell, Dallas, Tex.; Mutual Motor Car Company, Buffalo, N. Y.; Means Auto Company, Des Moines, Ia.; Marathon Motor Car Company, Muskogee, Okla.; Goss Supply Company, Cleveland, O.; State Automobile Company, Indianapolis, Ind.; Marathon Motor Sales Company, Reading, Penn.; Pausch, Selback Wagon & Auto Company, Columbus, O.; Albee & Baxter, Elkland, Penn.; Flatonia Automobile Company, Flatonia, Tex.; Hansen & Son, San Antonio, Tex.; M. Merget, Plymouth, Wis.; E. J. Dague, Port Kent, N. Y.; Apperson Motor Car Company, New York City; Horney Brothers, Weldon, Ia.; Rosenhaner & Eckerman, Early, Ia.; S. B. Gwin, Adair, Ia.; W. T. Pyland, Amarillo, Tex.; Livingston Motor Car Company, Bayonne, N. J.; Louis P. Meyer, Austin, Tex.; H. M. Lamphrey, Manchester, N. H.; Ernest Hohenberg, San Marcos, Tex.



Group of Firestone Tire Salesmen in Front of the New Factory Building at Akron, O., During Recent Convention.

GARAGE AND DEALER.

The Kansas City Automobile Supply Company, now at 1504 Grand avenue, Kansas City, Mo., has plans to erect a building on McGhee street, to cost $40,000.

G. B. Gould has sold his interest in the automobile firm of Gould & Woodke, Storm Lake, Ia., to A. D. Woodke.

The Hathorn Auto Company, Mason City, Ia., has moved to new quarters opposite the Federal building on East Fifth street.

Charles W. Loos & Sons, Coshocton, O., has leased quarters on Main street and will conduct an up-to-date automobile salesroom. It will handle the Overland, Rambler and Ford cars.

The Newcomer Auto & Supply Company has established business in the Gore building, Second street, Clarksburg, W. Va. Joseph W. Newcomer is general manager of the concern.

Robert R. Carter and L. H. Goodenberger have purchased the assets of the Tip Top Auto Company, Hood River, Ore., and the business will in future be known as the Columbia Auto & Machine Company.

Clarence Smith has purchased a half interest in the automobile and machine shop business conducted by W. P. Ruth. It is proposed to enlarge the plant and improve the equipment.

The Lozier Automobile Company, Philadelphia, Penn., formerly at 227 North Broad street, will locate at 21st and Market streets. The company will expend $10,000 in converting the building into a modern garage and salesroom.

The Maxwell Motor Sales Company, St. Louis, Mo., has been formed to handle the agency for the Maxwell line in that territory. The company is located at 306 North 12th street.

S. C. Bradford has secured the agency for the Studebaker cars, made by the Studebaker Corporation, Detroit, and will open a thoroughly equipped garage on Erie street, Storm Lake, Ia. Jay Lawton will be in charge.

The Fiat Automobile Company, Chicago, has leased the three-story building at 2289 Michigan avenue, of H. G. and A. L. Howard.

A. L. Maddrell of the North Jackson street garage, Monroe, Wis., has sold his interest to the Hokoson Automobile Company of Madison, Wis., which took immediate possession. The company is capitalized at $100,000 and handles about 500 cars a year.

The B. F. Goodrich Company, Providence, R. I., distributor for Goodrich tires, has announced a joint organization with the Diamond depot, distributor for Diamond tires. The new combination will occupy spacious quarters at 260 Weybosset street, that city.

The Standard Motor Car Company, Scranton, Penn., will erect an addition to its plant in Forest court, to cost $10,000.

Charles Benlen & Sons, 13th and Vineux streets, Cincinnati, O., is to establish a branch garage and storeroom on Rockdale avenue, to cost $10,000.

The Sawyer Auto Specialty Company, Columbus, O., formerly located at East Spring street, has moved to larger quarters at 50 East Long street. The company conducts a repair and manufacturing business.

Fred Waters, formerly of the Red Bank garage, Red Bank, N. J., has purchased Disbow's new garage at Red Bank.

W. L. Scholl, formerly in the automobile business at Hutchinson, Kan., has purchased the M & L garage at Sterling, Kan., and has taken charge.

The Clark Summers Auto Company, Sioux Falls, S. D., has opened a garage at 230 North Main avenue and will handle the Lambert, Cartercar and Metz lines.

Allen Hargrave, Cairo, Ill., has moved his garage and machine shop into the Dewitt building, thereby securing larger quarters.

G. Fischer has had plans prepared for an addition to his garage at 596 South 11th street, Newark, N. J., to be of brick and steel and cost $5000.

The Ford garage on Front street, Turlock, Cal., which has been operated by H. S. Dee, is now under the management of M. S. Henderson and F. A. Hale. A new and modern building will be erected.

The Middlesex County Garage & Sales Company, New Brunswick, N. J., has moved to 88 Albany street and will make improvements to the building. A stock of accessories and supplies will be added.

Bullock's Auto Station, 9-19 Seekonk street, Providence, R. I., of which Richmond B. Bullock is proprietor, has been established about five years and during that time Mr. Bullock has built up an efficient organization. Although no specialty is made of repair work, minor work for patrons is done. The principal features of the business, however, are storage, washing and polishing, for which an efficient and simple system is employed to prevent leaks. The garage shown in an accompanying illustration has a capacity of housing 24 cars and contains in addition 13 private sheds for patrons. It is located in a residential section of the city.

The Central Auto Company, West Sixth street, St. Paul, Minn., will in future handle the Premier cars, made by the Premier Motor Manufacturing Company, Indianapolis, Ind., in addition to its other lines.

The Lafayette Motor Car Company, Easton, Penn., has established new quarters at 233-235 North Third street.

The Queensboro garage at 66 Broadway, Flushing, N. Y., conducted by Jockers & Stack, is to be entirely remodelled. The company intends to start an automobile freight line and will begin operations with three large White trucks, made by the White Company, Cleveland, O.

The Co-Operative Tire & Supply Company, Cleveland, O., has opened a branch at Euclid avenue and East 20th street for the tires made by the Mansfield Tire & Rubber Company, Mansfield, O. The company will establish branches in various parts of the United States.

The Blasier-Sanborn Manufacturing Company, Utica, N. Y., with a capital stock of $150,000, has been formed to make and deal in steam and other pressure devices, machines and automobile supplies. George W. Sanborn of Little Falls, N. Y., is one of the promoters of the concern.

James Whitney, formerly with the garage firm of Bishop & Whitney, Elmira, N. Y., has formed a partnership with his brother, Albert Whitney, and they will conduct an up-to-date garage and repair shop in a building on Dewitt street. They will handle the Ford car, made by the Ford Motor Company, Detroit.

Charles J. Moody has occupied the new garage erected on River street, Elgin, Ill., and is equipped for all kinds of automobile business.

D. S. Wyckoff & Son has secured a building on Third street, White, S. D., and will immediately convert it into a modern garage and repair shop.

A. V. Rothwell, Ann Arbor, Mich., has purchased the garage and business at the corner of South Ashley and Madison streets. This location will be the headquarters for Buick cars, made by the Buick Motor Company, Flint, Mich., and Federal trucks, made by Federal Motor Truck Company, Detroit, Mich.

The Somerville Automobile Company, Somerville, Mass., has changed its name to the F. A. Dutton Motor Company and is now located at 76 Huntington avenue, Boston, where it will have the distribution agency for Abbott-Detroit cars, made by the Abbott Motor Company, Detroit. The company is capitalized for $25,000 and has the following officers: President, Frederick A. Dutton; treasurer, Charles A. Farnsworth; clerk, Jerome Smith. The old location in Somerville is being utilized as a service station.

J. B. Garver of Terra Bella, Cal., is establishing a modern garage and auto hospital on Main street, in which he will sell and care for Studebaker cars, made by the Studebaker Corporation, Detroit.

The Hunter Motor Company, Roanoke, Va., will soon open its automobile salesrooms and garage in the new building at Henry street and Luck avenue.

The Central Avenue garage, 934-936 Rose street, Reading, Penn., has been completed and is now ready for business. Harbster Bros. is the proprietor.

Martin's garage is the name of the old Coalinga garage, Coalinga, Cal., which will be reopened at once under the management of C. C. Kratzer. A complete line of automobile supplies, tires, etc., will be carried.

The Bennett Auto Supply Company, Sioux City, Ia., one of the largest sales organizations in the northwest, has occupied Motor Mart, said to be the largest building devoted exclusively to automobiles in that section of the country. The company has the agency for the Moon cars, made by the Moon Motor Car Company, St. Louis, Mo.

The Frank E. Parmelee Company, 132 Adams street, Chicago, will erect a one-story brick garage at 1117-1145 West Monroe street.

Pearl W. Devendorf, LaFargeville, N. Y., has taken over the Warner garage on Arsenal street, Watertown, N. Y.

Roy Worden and Jay Gould, Yuba City, Cal., have leased the Sutter garage of Frank Schellenger and will conduct it along broadened lines.

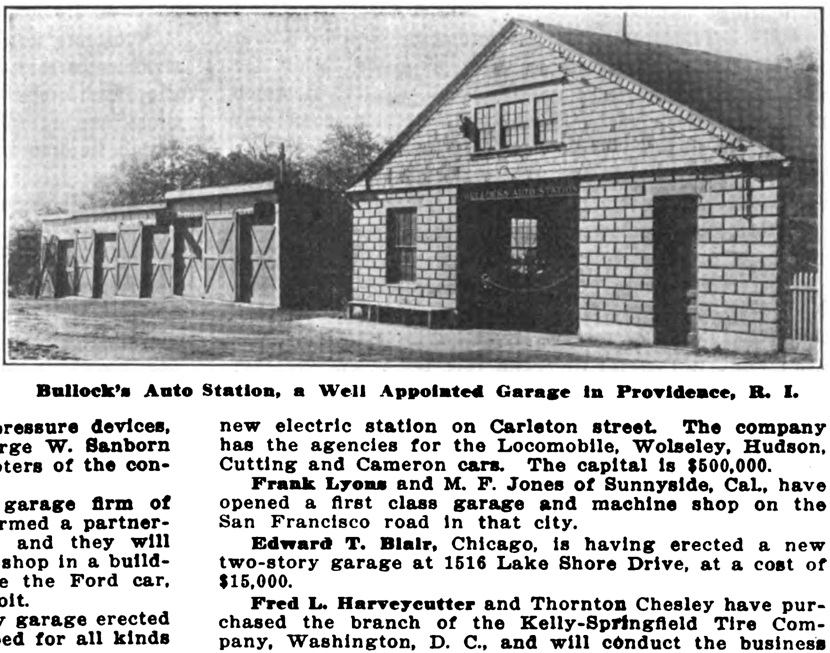
Alpheus Lane has sold his interest in the City garage, Paola, Kan., to J. W. Torrey of Kansas City.

Eric J. Gustafson has moved his garage from North Court street, Rockford, Ill., to the new Stewart building on Waterworks park.

P. F. Leeland and Hampton Mays have opened a modern garage and repair shop on East Conner street, Jacksonville, Fla.

The McKeesport Vulcanizing Company, McKeesport, Penn., of which S. L. Stitler and Harry Lebewitz are proprietors, has occupied a completely equipped plant at 214 Fourth avenue, for the vulcanizing and general repair of rubber tires.

The Canadian Motor Company, Winnipeg, Manitoba, Can., recently formed, has acquired the business recently carried on under the name of Ft. Rouge garage and also will control the City garage on Portage street and the new electric station on Carleton street. The company has the agencies for the Locomobile, Wolseley, Hudson, Cutting and Cameron cars. The capital is $500,000.



Bullock's Auto Station, a Well Appointed Garage in Providence, R. I.

Frank Lyons and M. F. Jones of Sunnyside, Cal., have opened a first class garage and machine shop on the San Francisco road in that city.

Edward T. Blair, Chicago, is having erected a new two-story garage at 1516 Lake Shore Drive, at a cost of $15,000.

Fred L. Harveycutter and Thornton Chesley have purchased the branch of the Kelly-Springfield Tire Company, Washington, D. C., and will conduct the business at the same location, 1730 14th street.

Edgar S. Harrington, proprietor of the Milford garage, will erect a modern garage on East Front street, South Milford, Del.

M. H. Taylor of Elmira, N. Y., has opened a new garage at the corner of Gray and State streets, to be known as Taylor's garage.

The Overland Auto Company, Phoenix, Ariz., has been formed to handle the Overland cars in that territory and an agency has been established at 329 North Central avenue. A. S. Earnhart is the manager.

The Santa Monica Auto Station, Santa Monica, Cal., is undergoing extensive repairs to prepare for an increased business.

J. J. Backus, chief building inspector of Los Angeles, Cal., has completed plans for the proposed municipal garage, machine shop and warehouse.

Bruce Champion, Osage, Ia., is the proprietor of a new garage and automobile repair shop in the William Champion building on Main street.

W. N. Eisenbradt is having a new garage built at a cost of $4000, to be located at 441 Drexel boulevard, Chicago.

Fred Linsy of the firm of Linzy & Selover, Auburn, N. Y., and located in the Empire garage, has purchased the interest of his partner, Floyd Selover, and will control the business himself in future.

DIRECT FROM DEALER TO THE MANUFACTURER.

Free Service Established by the Accessory and Garage Journal to Furnish Confidential Business Intelligence, Relating to Production and Distribution, to the Buying and Selling Interests of the Nation.

The demand by the trade, as represented by the dealers in and agents for both pleasure and commercial vehicles, accessories and supplies, the garage and public service stations and repairmen, for information relative to the qualities and merits of all marketable products in the automobile industries, has attained such proportions as to impel the establishment of a Trade Information Exchange, in connection with the publishing of the Accessory and Garage Journal.

This service, complete and comprehensive in every detail, is absolutely without charge to all concerns listed in the Buyers' Guide in The Automobile Journal, Motor Truck and the Accessory and Garage Journal, and to all automobile dealers, accessory and supply dealers, garage and public service station owners, and repairers, who are regular subscribers to the Accessory and Garage Journal. This service does not extend to manufacturers and selling agents for manufacturers not listed in the Buyers' Guides of the publications named.

This service offers to all manufacturers of power driven vehicles, equipment and supplies, who are entitled to its advantages, the opportunity to reach those interested in selling and distributing in any town, city, state or section of the country.

No business man has always at his command the trade information that might be desirable. Demands made upon the trade are such that no one can compile such reference as will inform him of every industrial fact it may be imperative to know. He has no source available from which this information may be obtained. This Exchange has been established to supply any industrial or trade fact to its members at request. This service economizes the time of the business man and his customer; it minimizes correspondence; it places the dealer in contact with every product in the particular line under consideration and the manufacturers' selling propositions; the dealer purchases that which will best meet his requirement and satisfy his customer, and the dealer has the use of this information in all his future transactions. It gives every interest in the market equal consideration and opportunity.

Thousands of active enterprises, seeking expansion or desirous of making new connections, have in this service the means of conducting their negotiations confidentially and securing information that must be beneficial to all manufacturing and distributing interests.

All trade information passing through the Exchange is of a confidential character. Inquiries received from those in the trade relative to prospective connections or associations are distributed to the manufacturing interests of which information is desired. The replies of the manufacturers or selling agents pass through the Exchange direct to the inquirer, who then conducts his negotiations as his judgment dictates.

Manufacturers through this service will be able to reach desirable trade interests in territory now having no representation, and enabled to complete their organizations.

To illustrate the Trade Information Exchange service:

John Smith of Phoenix, Ariz., desires to secure the agency for a car selling for $1200. He communicates with the Exchange, stating his limitations and that he is desirous of obtaining sales rights for a specified territory. His inquiry is given a number. Its purport is submitted to all makers of cars within the price limit fixed entitled to the service. The replies of the manufacturers to the number are received at the Exchange and are forwarded to John Smith. He considers the facts and propositions submitted and closes the contract.

John Smith has had opportunity to pass upon all the qualities of every car and every proposal. He selects that which he judges will be the best from a business point of view. Every manufacturer has received equal consideration and each has the knowledge that his production has been approved or rejected from its actual qualities and merits.

Thomas Jones, who is to establish a garage, desires a full equipment. In his letter of inquiry to the Exchange he states his exact requirements, and these are submitted to those producing the lines in which he has interest and from which he will make a choice.

Any dealer desiring to expand his business and make new connections can make the fullest inquiry in the market through the Exchange.

This service extends to all branches of the industries. The correspondence is passed and submitted as stated, the negotiations being as confidential as those concerned in them may desire.

To facilitate the interests of the Exchange and those whom it is intended to serve, address all correspondence to the Trade Information Exchange, Accessory and Garage Journal, Times Building, Pawtucket, R. I.

TEMPERING SCREW DRIVERS.

The principal reason for hardening and tempering screw drivers is to make them tough, exceptional hardness not being necessary as they are not called upon to do any cutting. The water bath generally used tends to harden the metal rather than toughen it. If water be employed it should be heated nearly to the boiling point. Oil is superior to the water method.

GALVANIZING CAST IRON.

To galvanize cast iron the casting should be cleansed thoroughly by immersing it for a few hours in a bath of one part muriatic acid and two parts water. After removing the work it should be scrubbed thoroughly with a brush and fine sand, after which it is washed with hot water. When the metal is clean it is dipped in a solution comprising one-half pound of sal ammoniac to a gallon of water. It should be dried quickly and dipped in a zinc bath. If the surface of the metal be oily, the grease may be removed by boiling in caustic soda or lye.

TRADE INFORMATION EXCHANGE
BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding.

CAR AGENCIES DESIRED.

1488—California Concern is desirous of securing the agency for pleasure cars selling from $500 to $2000.

3259—Oregon Firm, about to open an automobile supply house and vulcanizing shop, is seeking the agency for a pleasure car to sell in Oregon from $900 to $1200.

6704—South Dakota Company, which has recently opened a first class garage, is making inquiries with a view to securing agencies for pleasure cars selling from $495 to $2100.

1111—California Dealer, well located in northern California, would like the agency for a high class motor truck selling at $5000.

1231—Texas Sales Company, entering business with a capital of $200,000, is in the field for agencies for pleasure cars selling between $400 and $3000, and commercial vehicles selling betwen $600 and $5000.

1410—North Dakota Company, recently changed hands, is seeking a car to put on the firm's market at from $1000 to $1500.

2041—Florida Firm, enlarging its business with increased capital, is interested in the agency for cars selling from $750 to $3000.

3514—New York State Dealer, who recently purchased garage business in prosperous condition, is anxious to take the agency for pleasure machines listing from $950 to $2000 and motor trucks from $500 to $5000.

2340—Maine Motor Company, recently formed, is interested in cars selling from $700 to $1500 and commercial vehicles listing from $700 to $2000, for which it can secure the agency in its territory.

7604—Iowa House, doing retail and wholesale business, is seeking the agency for a pleasure car selling between $750 and $1500.

5534—New York State Garage and Machine Works, establishing itself in new and larger quarters, is interested in the agency for cars listing from $300 to $1200.

1536—South Carolina Supply Company, doing all kinds of automobile business, is contemplating the agency for pleasure and commercial vehicles. Would like pleasure cars listing from $500 to $2000 and motor trucks from $500 to $1000.

6950—Kentucky Concern, recently incorporated to carry on a general automobile business in eight counties, is in the field for the agency for motor trucks selling between $3000 and $3500.

4312—Iowa Dealer, recently taking sole ownership of thriving business and contemplating erecting a modern building in the spring, is seeking agency for a desirable car selling from $900 to $1500.

7374—Missouri Concern, doing business in two states, would like the agency for power wagons listing between $1000 and $2000.

7227—Idaho Firm, reorganized with increased facilities, would take the agency for a good car selling from $1000 to $2000.

1716—California House, recently changed hands, is interested in agencies of pleasure cars listing from $750 to $2000 and commercial vehicles listing from $1000 to $2500.

5061—Massachusetts Garage Company, incorporated a short time ago, is desirous of taking the agency for pleasure cars selling from $700 to $3000 and power wagons selling between $700 and $2000.

6431—Alabama Company, already handling a line of first class cars, is interested in the agency of still another line selling from $1000 to $3000.

ACCESSORY AGENCIES.

6745—Indiana Dealer, conducting well located establishment, will take agency for automobile supplies, equipment and accessories for pleasure and commercial vehicles.

6964—New York State Company, building a new home, will take agencies for all kinds of pleasure and commercial vehicle accessories, equipment and supplies.

3091—Iowa Garage, occupying new and larger quarters, is interested in a good line of automobile supplies.

6764—Kentucky Concern, which has established a new garage and which handles a high grade line of automobiles, will take agency for supplies, equipment and accessories for pleasure and commercial cars.

2976—Tennessee Company, recently incorporated, is desirous of handling a first class line of accessories, equipment and supplies for pleasure and commercial cars.

8226—Michigan House, under new management, would like to represent a good line of accessories and supplies.

7968—New York State Firm, which has just opened a new supply department, is anxious to represent first class makes of general accessories and supplies.

6810—Georgia Garage, in enlarged quarters, is interested in automobile accessories, equipment and supplies for the trade.

5273—Massachusetts Concern, incorporated recently to conduct a general automobile business, is interested in everything pertaining to accessories and supplies for pleasure and commercial vehicles. It is especially desirous of securing a good line of speedometers, tops, tire covers and irons.

8126—California Company, doing good business in excellent locality, would like to represent general line of automobile equipment, accessories and supplies.

1291—Idaho Corporation, doing general automobile business, is interested in accessories, supplies and equipment for pleasure cars.

3746—Missouri Firm, handling high grade cars in two states, would take agencies for pleasure car accessories and motor truck equipment.

5786—Iowa Dealer, about to build new, modern garage, would like a complete line of automobile supplies.

4769—Kentucky Automobile Company, handling first class type of pleasure cars in several counties of that state, will represent good makes of accessories, equipment and supplies.

4355—New York State Garage, in good location, is interested in a complete line of equipment, supplies and accessories, for which it is seeking agencies.

5668—Iowa Corporation, conducting retail and wholesale automobile business, and maintaining a store in connection with its garage, is interested in and would take agency for any accessory, supply or equipment that is new to the market.

4231—Maine Motor Company, just opening a new garage, is interested in automobile accessories and solicits catalogues and books of parts with a view to taking agencies for good line of stock.

4669—New York State Company, recently changed hands, would take agency for pleasure and commercial car accessories and supplies.

3227—Florida Concern, recently incorporated to care for increasing business, is interested in securing agency for supplies and accessories.

5295—North Dakota Firm, under new ownership, would like agency for automobile equipment, accessories and supplies, and also supplies for motor trucks.

TRADE INFORMATION EXCHANGE---Continued.

6175—Texas Corporation, with a capital of about $200,000 and representing in that state five makes of pleasure cars and two types of motor trucks, is interested in all kinds of supplies, accessories and equipment for pleasure and commercial vehicles, for which agencies will be taken.

2972—California Dealer, now handling trucks exclusively, would take agency for first class power wagon equipment.

8230—South Dakota House, handling three makes of pleasure cars, would like to represent line of accessories, supplies and equipment.

7369—Oregon Company, in town of 8500, conducting supply store, would like to get in touch with accessory supply concerns with view to assuming agency.

3257—California Firm, handling well known make of car, is interested in securing agency for automobile accessories, equipment and supplies.

EQUIPMENT NEEDED.

6497—Kentucky Concern, recently formed, is interested in garage and repair shop supplies, and machine tools.

4527—Florida Company, about to erect a modern garage, is in the market for garage and repair shop equipment and supplies.

7373—Missouri Company, opening a factory branch, is interested in garage equipment.

7122—Idaho Concern, recently reorganized to do general automobile business and planning to erect large, modern garage in the spring, is in the market for garage and repair shop supplies and equipment, including full line of machine tools.

5520—Massachusetts House, recently incorporated, is seeking information regarding garage equipment and supplies and repair shop supplies.

6182—Georgia Firm, about to remodel building, is in the field for first class garage equipment.

7869—New York State Concern, extending its business, is desirous of acquiring a line of garage and repair shop supplies.

8643—Michigan Firm, which recently purchased an established repair shop business, is seeking supplies of various kinds.

7269—Tennessee Company, recently organized to occupy a large building, is in the market for garage and repair shop equipment and supplies.

4765—Kentucky Concern, establishing new garage, is interested in garage supplies and equipment.

2921—Michigan Manufacturing Company, about to build a large plant, is in the market for machine tools, repair shop supplies and equipment.

3917—Iowa Garage, recently moved into new quarters, is interested in garage equipment and supplies and repair shop supplies of all kinds.

4962—New York State Company, about to build new garage, wants information concerning repair shop and garage equipment and supplies, including machine tools.

4756—Indiana Garage, under new management, wants machine tools, repair shop and garage equipment and supplies.

3142—California Concern, occupying enlarged quarters, is seeking a line of repair shop equipment and supplies.

6872—South Dakota Company, doing good business in new building, is interested in garage and repair shop equipment.

1291—California House, in new location, desires information relative to repair shop equipment.

1637—Texas Sales Company, which maintains large service station, is in the field for all kinds of repair shop and garage supplies and equipment, including machine tools.

2347—Florida Garage, enjoying greatly increased business, wants information concerning garage supplies, repair shop equipment and machine tools.

3456—New York State Concern, in well established garage, is interested in repair shop equipment.

2432—Maine House, occupying fine new building, is interested in a line of garage equipment and supplies and repair shop supplies.

7568—Iowa Company, formed a short time ago and soon to fit up new garage and repair shop, is interested in the newest and most up-to-date equipment, including machine tools, etc.

5443—New York State Concern, remodelling building for its purposes, desires information relative to full line of machine tools, garage and repair shop supplies and equipment.

1542—North Dakota Firm, recently changed hands, is interested in a complete line of repair shop and garage supplies and equipment, machine tools, etc.

Pleasure Car & Motor Truck Wheels

Eberly & Orris Wheels Are Built of Carefully Selected Bone-Dry Timber, With High Class Facilities by Expert Mechanics.

Pleasure Car or Truck Equipment Made to Any Specification and in Any Quantity.

Can Supply Any Requirement. Catalog and Price List at request.

Auto and Truck Wheels Repaired and Returned Same Day

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"PASS THEM ALL"

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BEST BY TEST
MOTOR CARS

Send for Pleasure or Commercial Catalogue.

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STOLEN AUTOS
Can be prevented with our
AUTOLOCK SWITCH

Put on Coil or Dash in ten minutes. Yale key for plug. One operation. Write for descriptive folder and price.

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30% More Mileage

Save The Tires

Every automobile owner and every dealer has been interested in watching our National advertising of Tirenew. The big demand it has created means profit to the dealer.

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TIRENEW
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Prevents Tire Decay

is a liquid, unvulcanized rubber compound made with a base of pure gum—waterproofs and protects from oil, moisture, sun and air. *Makes Tires Look Like New.* There are imitations which paint but don't protect—insist on Tirenew. Send $1.00 for a can—enough to Tirenew 8 tires. Ask about our other products:

Narco Rubber Reviver | Non-inflammable Rubber Cement | Leakanot, a liquid, rubber, waterproofing dressing for anything leather.

NATIONAL RUBBER COMPANY, 4433 Papin St., St. Louis, Mo.

New Departure "TWO-IN-ONE" Ball Bearings

The only ball bearing that takes load from any direction with equal efficiency.

Catalog for the asking

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America's Leading Automobile Oil. Ask Your Dealer.

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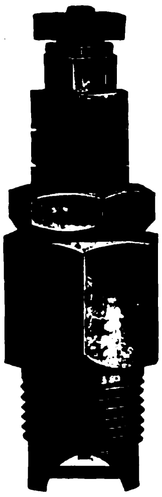

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Spark Plugs

Do not foul, soot or short circuit. A high grade plug at a low list price. Scientifically constructed. Our discount to jobbers and dealers makes the cost of these plugs very low. Write for catalogue.

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HEINZE ELECTRIC COMPANY
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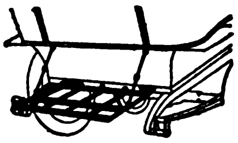

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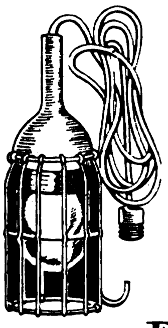
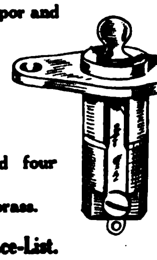
PORTABLE HAND LAMPS

only absolutely safe lamp for use where gasolene is used. Vapor and waterproof.





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In one, two, three and four button.

Nickel, polished or old brass.

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30 Cents

will bring you a sample to prove it to you.

Special Inducements to the Trade.

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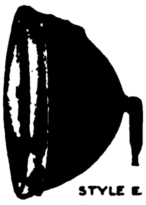
Try the New Aluminum Solder. Ask for "Simplex."

"SIMPLEX" Solder has the stick.

Electric Star Auto Headlights and Tail Lamps

The lamp that has no rivets nor solder, and only one screw used in its construction. It is made of cast silvered aluminum, and the interior is highly polished, which does not tarnish. The convex lenses are laid in rubber, which makes them water and dust proof, and same is the strongest lamp made. Write for catalogue. Mfd. by

Milwaukee Bronze Casting Co., 119 Clinton St., Milwaukee.



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The "Handiest Tool In the Shop"
Portable Floor Crane and Hoist

Makes Car Handling an Easy Job.

Useful in Hundreds of Ways and Always Ready. A Certain Economizer of Time and Money. Booklet "E4" for the Asking.

Canton Foundry & Machine Co., Canton, O., U. S. A.

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TIRE CASE

ABSOLUTE TIRE PROTECTION
GIVEN ONLY BY THE
Hopewell Tire Case

It prevents any water entering the spare tire (either from rain or hose used in washing). Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

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THE "ALL-IN-ONE" SPARK PLUG

All That the Name Implies

Prime your engine and clean your plugs at the same time.

Price $1.50 Each

Powerful
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Designed and constructed for use with high or low tension magneto and battery ignition systems.

Made to fit any engine

We shall prosecute vigorously all infringements now on the market or any which may spring up in the future

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THE GILSON Starter and Speeder

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Guaranteed to save gasoline, give more power and speed, cut down carbon, and starts your motor on second turn in any temperature. For automobiles, motorcyles and all gasoline engines. Sold on merit, **$10.00.** Cannot get out of order. All users indorse it. Order direct or from your dealer.

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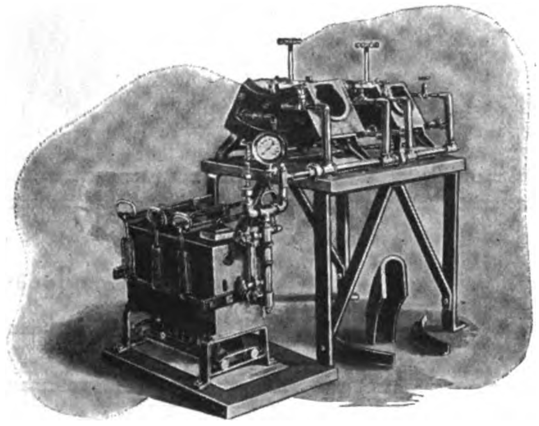
Are You Getting Your Share of The Dollars?



TIRE REPAIR MEN ARE MAKING MONEY. Right now and for the next two months this business will be at its best. Tires that were new in the spring need repairs. Auto owners are repairing tires to make them last out the season. An increasing number of cars will be run all winter.

YOU OUGHT TO SHARE IN THE PROFITS. Install an **AKRON-WILLIAMS** outfit, the kind used and recommended by twenty-seven out of thirty tire makers and by successful repair men everywhere. Ask your tire maker about us.

IT DOESN'T TAKE MUCH MONEY to buy the best plant and you can make more with it than with an investment four times as large in any other line. We have outfits from $40.00 to $1000.00, depending upon how much and what range of work is to be handled. Every outfit is standard.

Get Into This Profitable Business *Now*

Write Today for Catalog 12

The Williams Foundry & Machine Company

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GOOD AGENTS WANTED

To sell new invention for automobiles. Saves 1-3 gasoline. Don't delay. Write us at once for territory. We have salesmen making $50.00 per week. Natl. Mfg. Co., Kalamazoo, Mich.

WANTED—Salesmen, calling on garages and repair shops, are wanted to handle one of the best and most practical tire vulcanizers on the market for the man who does not care to buy a large, expensive plant. A vulcanizer that is unequalled in volume of first-class work, cheapness of operation and low cost. Made in five models of different capacities and sold from $20 to $45. A demonstration will sell them to every man who has anything to do with the repairing of rubber tires. If you are open for a good liberal commission proposition and are willing to make a deposit on a sample write for terms. Diamond Manufacturing Co., 503 Equitable Bldg., Des Moines, Iowa.

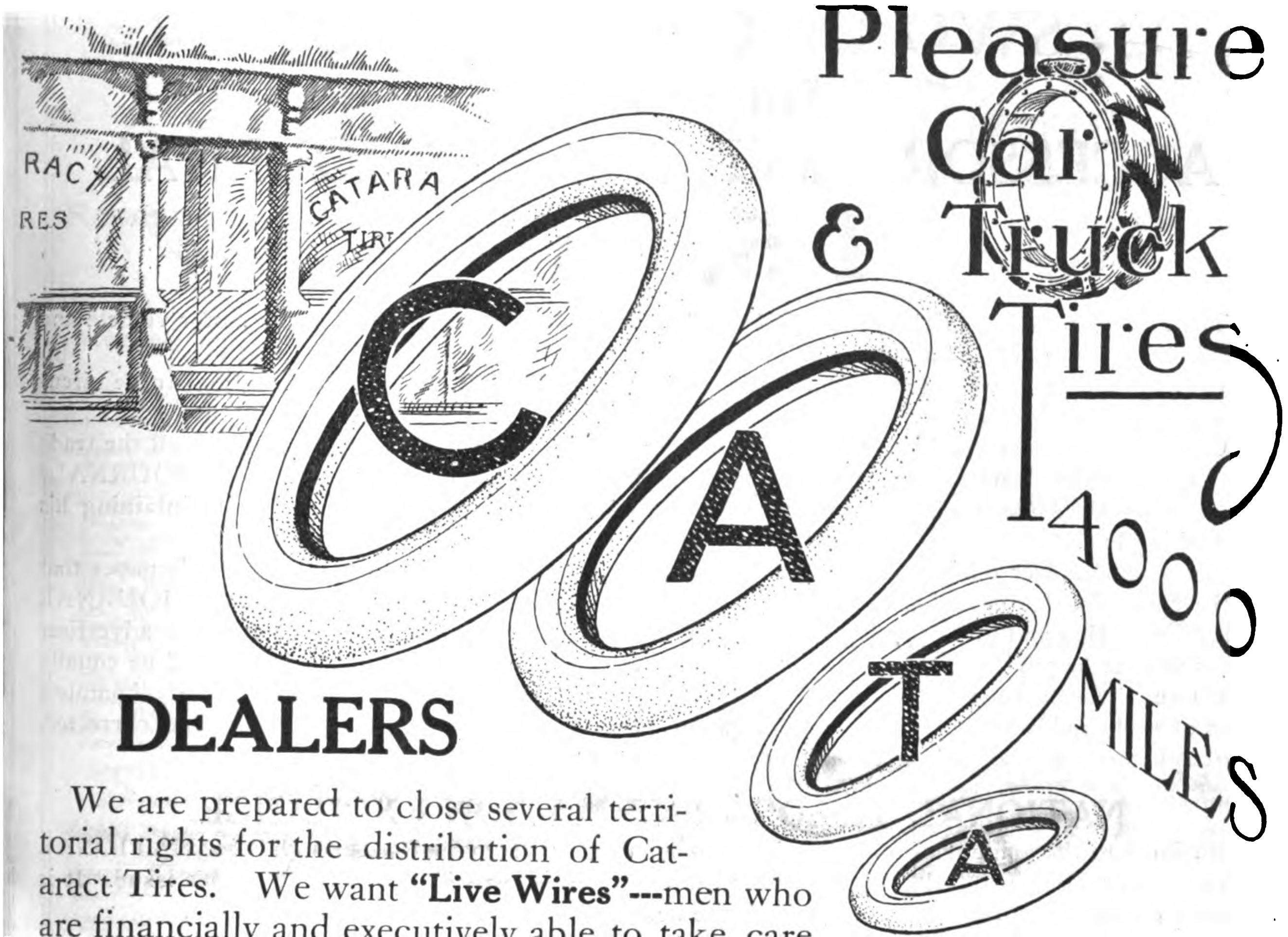
FOR SALE—Auto bodies, fore door, new, $60.00 to $95.00. Motors; Axles; Tires; Auto parts and accessories. Closing out factory stock. Independence Motors Co., Detroit, Mich.

FOR SALE—Attention of Truck Makers—We have on hand about 500 jack shafts for a 1000 to 1200-pound truck. These we will not be able to use owing to a change in design and to an interested party that can use these parts we will make a sacrifice price. Box 50, Accessory & Garage Journal.

CHAUFFEUR'S COMPLETE OUTFIT SACRIFICED—Consisting of elegant mink fur lined coat, Persian lamb collar $35, pair of elegant bear robes $15 each, Racoon Cap $5, pair of fur gloves $4, pair of goggles 50c. one pair leather leggins $3.50. Will sell separately or the lot, all new, never worn; original price $225. G. Chase, 118 East 28th St., New York.

PLANT FOR SALE; CHEAP—Suitable for Manufacturers of Automobile Bodies and Accessories. Equipped with Power, Lights and Sprinklers. Abundant Storage. The A. J. Phillips Co., Fenton, Mich.

WANTED—Boston firm, Manufacturers' Sales Agents, would like two or three more lines in New England. Wholesale only. Box Y, Automobile Journal Office, Pawtucket, R. I.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Pleasure Car & Truck Tires
4000 MILES

DEALERS

We are prepared to close several territorial rights for the distribution of Cataract Tires. We want **"Live Wires"**---men who are financially and executively able to take care of a big proposition.

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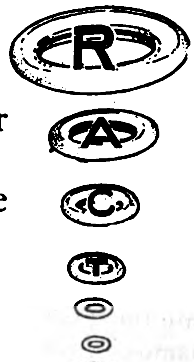

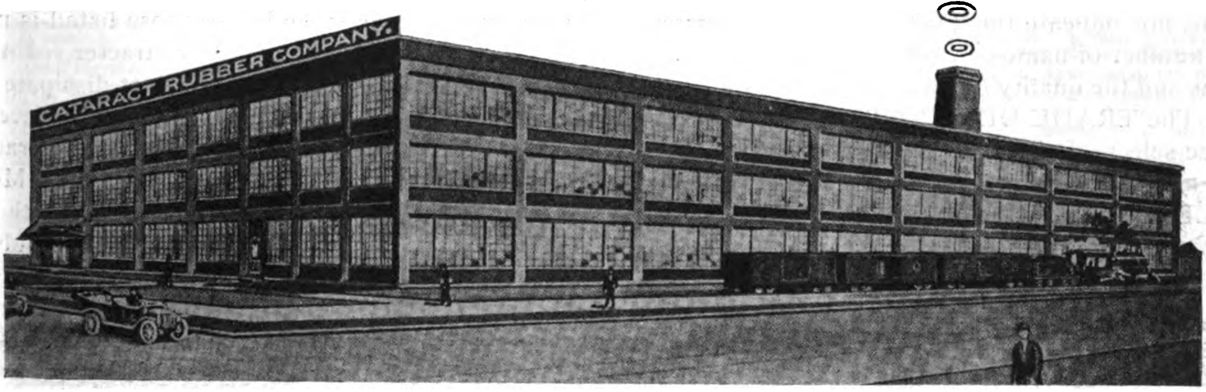
CATARACT RUBBER COMPANY

CATARACT RUBBER COMPANY

Boston NewYork Providence Buffalo
Factory: Wooster, O.

SWORN CIRCULATION

January Issue

ACCESSORY and GARAGE JOURNAL

15,000

The ACCESSORY and GARAGE JOURNAL is the only paper devoted to the motor vehicle and allied industries published in America.

It is the only publication that guarantees to have 100 per cent. trade circulation and trade circulation value.

Can any advertiser reach the consumer and the trade in any one print? Can he reach all the trade in any one or even a series of magazines other than the ACCESSORY and GARAGE JOURNAL? Can he obtain the same service at 10 times the cost through other publications, or by maintaining his own mailing list?

The manufacturer must reach the trade. The logical medium for publicity is the trade paper that has the trade circulation and can give the trade service. The ACCESSORY and GARAGE JOURNAL has the circulation and gives the service, and both are guaranteed by the management. The advertiser obtains all that he pays for and saves at least 90 per cent. of the cost of publicity that would be equally productive. The mailing list of the ACCESSORY and GARAGE JOURNAL is the only complete record of trade and industrial names and addresses in existence, and it is daily revised and corrected. Its great value is its thorough maintenance.

NATIONAL TRADE INFORMATION EXCHANGE.

Business to the amount of millions of dollars is transacted annually through the NATIONAL TRADE INFORMATION EXCHANGE. It is described on pages 36, 37 and 38 of this issue. It is the most efficient service ever developed for the benefit of advertisers by any publication.

TRADE DIRECTORY LISTS.

The classification by name and product of firms doing a nation-wide business has a value that cannot be over-estimated. The quality of such lists depends entirely upon the care with which they are prepared, and their productiveness is in ratio to their completeness. But the best list would be valueless unless distributed to those who can make use of it.

The average trade directory is available to a few thousands under the most favorable conditions. Occasionally these are revised more than once a year. The majority are published annually. These directories, having limited circulation, are not general references. They are not as dependable and reliable as were they revised more frequently. They do not differentiate the standing and prestige of the firms, nor indicate the quality of their products. The chief value of the trade list to those listed is not the number of names, for this would not specify reputation nor prestige, but in the character of the firms and the quality of their products. The selected list concentrates business and does not dissipate it.

The TRADE DIRECTORY or BUYERS' GUIDE illustrated on the following pages is in every sense select. It is made up of representative, reputable firms, all recognized in the industry and trade, and all promotive and not destructive of business. This list appears in all issues of the AUTOMOBILE JOURNAL, the MOTOR TRUCK and the ACCESSORY and GARAGE JOURNAL, there being 48 separate editions the year, and is also published in the series of STANDARD AUTOMOBILE MECHANICAL HANDBOOKS, 12 books in the series, published by this company.

The DIRECTORY is revised daily and published as revised. It is published in magazines and handbooks that are bought to read, and it is circulated wherever the English language is spoken. It is placed in the hands of those who are buyers. It has a distribution of more than 1,000,000 copies annually.

This service is free to all yearly advertisers in any of the three magazines.

Automobile Journal Publishing Company

Publisher of

Automobile Journal	**Motor Truck**	**Accessory and Garage Journal**
Times Building		**Pawtucket, R. I.**

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Caldwell Mfg. Co., 1756 Cranston St., Providence, R. I.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York.

Miller, Chas. E., 97-103 Reade St., New York.
Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York, 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 185 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

AUTOMOBILE SPECIALTIES.

Sumner George, Inc., 1841 Broadway, New York.

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

Merburg Bros., Inc., 1786 Broadway, New York. (S. R. O.)

New Departure Mfg. Co., Bristol, Conn. (New Departure.)

R. I. V. Co., 1771 Broadway, New York. (R. I. V.)

BATTERIES.

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York.

Lincoln Electric Co., 1007 Atlantic Ave., Brooklyn, N. Y. (Hi-Po Waterproof Dry.)

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 248 Monadnock Bldg., San Francisco.

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind., South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston; 237 Lafayette St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1480 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Mayer Carburetor Co., 2678 Main St., Buffalo, N. Y. (Mayer.)

Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)

CARBURETION EXPERT.

Sumner, George, Inc., 1841 Broadway, New York.

CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

CARS—GASOLINE PLEASURE.

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Brush Runabout Co., 3 West 61st St., New York. (Brush runabout, Liberty-Brush.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)

Croxton Motor Car Co., Washington, Penn. (Croxton.)

Cutting Motor Car Co., Jackson, Mich. (Cutting.)

Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.

Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (E-M-F and Flanders.)

United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)

Available Truck Co., 2834 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st St., New York. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clark, E. S., 242 Freeport St., Dorchester Dist., Boston. (Clark.)

Federal Motor Truck Co., Junction & Leavitt Sts., Detroit. (Federal.)

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Knox Automobile Co., Springfield, Mass. (Knox.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Peerless Motor Car Co., Cleveland, (Peerless.)
Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Stewart Motor Corporation, Buffalo, N. Y. (Stewart.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st St., New York. (Sampson, Brush, Stoddard.)

V. C. Motor Truck Co., Lynn, Mass. (V. C.)

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

United States Motor Co., 3 West 61st St., New York. (Sampson.)

BUYERS' GUIDE---Continued

Victor Motor Truck Co., 1010 Ontario St., Buffalo. (Victor.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)

Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.

Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

J. & B. Manufacturing Co., Pittsfield, Mass. (Type J. C.)

CONTROLLERS AND ECONOMIZERS.

Moller Brothers Controller & Economizer Co., 700 Betz Bldg., Philadelphia. (M. & M.)

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CUSHIONS.

Leavens & Co., Wm., 32 Canal St., Boston. (Leavens Shock Absorbing.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FORE DOORS.

Lortz & Co., F. E., 2503 E. 55th St., Cleveland.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASKETS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vellumoid.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Automobile Supply Manufacturing Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston. (Jericho, Jubilee.)
Branch: 918 Eighth Ave., New York.

IGNITION DEVICES.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Master Vibrator.)

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

Hartford Suspension Co., 146 Bay St., Jersey City.
Branches: 1700 Broadway, 212-214 W. 88th St., New York; 325 Columbus Ave., Boston; 1437 Vine St., Philadelphia; 1458 Michigan Ave., Chicago; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.; 803 Woodward Ave., Detroit; 448-450 No. Capital Blvd., Indianapolis.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

Milwaukee Bronze Casting Co., 119 Clinton St., Milwaukee, Wis.

Morse, Frank W., 516 Atlantic Ave., Boston.

LICENSE NUMBER BRACKETS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)

Geissler Bros. Storage Battery Co., 514-520 W. 57th St., New York.

J. & B. Manufacturing Co., Pittsfield, Mass. (J. & B. Light Regulator.)

Remy Electric Co., Anderson, Ind. (Remy.)

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 148 No. Wabash Ave., Chicago.

Hows, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Bldg., Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia. (Invader.)
Branch: 284 Columbus Ave., Boston.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York. (Monogram.)
Branches: 126 Massachusetts Ave., Boston; 37 New Jersey R. R. Ave., Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia; 1436 Michigan Ave., Chicago; 1111 Superior Ave., N. W., Cleveland; 435 Turk St., San Francisco; 618 Banning St., Los Angeles, Cal.; Virginia and Railroad Ave., Seattle, Wash.; Spokane, Wash.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Standard Oil Co., New York. (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.

Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)

Marburg Bros., 1786 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: 18-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; Mass. Ave. & St. Germain St., Boston; 430-36 Van Ness Ave., San Francisco; 868 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.; S. W. Cor. Cherry & Juniper Sts., Philadelphia; 1828 Grand Ave., Kansas City; Seattle, Wash.; London, Eng.; Buenos Ayres.

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Auto & Saval.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

Emblem Manufacturing Co., Angola, N. Y. (Emblem.)
Branches: Los Angeles, San Francisco.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Miami Cycle & Manufacturing Co., 820 Hanover St., Middletown, O. (Flying Merkel.)

Swenson, B. A., 522 Broad St., Cor. Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Hazard Motor Manufacturing Co., 780 Centre St., Rochester, N. Y. (Hazard.)

Rutenber Motor Co., Marion, Ind. (Rutenber.)

PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

POLISH.

International Metal Polish Co., Quill St. and Belt R. R., Indianapolis, Ind. (Blue Ribbon.)

PUBLICATIONS, AUTOMOBILE.

The Automobile Journal, 24 issues, $1.00 the year.

The Motor Truck (Commercial Car.) Monthly, $1.00 the year.

The Accessory and Garage Journal, Monthly, $1.00 the year.

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Maintenance and Repair of Motor Car Tires .... .25

Lighting the Motor Car by Electricity.. .25

Sent Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

PUMPS, OIL AND GREASE.

Randall-Faichney Co., Boston. (B-Line.)
Branches: See Horns.

PUMPS, TIRE.

Dewey-Anderson Co., Toledo, O. (Dewey Power.)

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (L B A.)
Branches: See Batteries.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 908 Boylston St., Boston.

Hartford Suspension Co., 146 Bay St., Jersey City. (Truffault-Hartford.)
Branches: See Jacks and Lifting Devices.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Elliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Seger Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paco.)
Branch: 1974 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Heinze Electric Co., Lowell, Mass. (H. E. Co. Priming.)

Janney, Steinmetz & Co., Philadelphia.

Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)

Randall-Faichney Co., Boston. (Mac-Kae.)
Branches: See Horns.

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: See Magnetos and Magneto Supplies.

Standard Co., The, Torrington, Conn. (Black Eagle.)

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston. (Mac-Kae Blitz.)
Branches: See Horns.

SPEEDOMETERS.

Hoffecker Co., The., Motor Mart, Boston. (Hoffecker.)

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1480 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 590 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Marburg Bros., Inc., 1786 Broadway, New York. (Marburg-Hagen.)

Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, E. 65th and Central Ave., Cleveland.

SPROCKETS.

Boyd, F. Shirley, 908 Boylston St., Boston. (Baldwin.)

STEEL PARTS, SEAMLESS.

Standard Welding Co., Cleveland.

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE ACCESSORIES.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark. N. J.

National Rubber Co., 4483 Papin St., St. Louis, Mo. (Tirenew.)

Page-Lester Co., 2644 Indiana Ave., Chicago. (Tite-Wad Rubber Putty.)

TIRES—CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: 15 Park Sq., Boston; 1731 Michigan Ave., Chicago; 905 First Ave., South, Minneapolis; 1529 Cleveland Place, Denver; 1088 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco; 917 E. Pike St., Seattle; 816 North Broad St., Philadelphia; 1197 Broadway, New York; 48 Auburn Ave., Atlanta, Ga.; 748 Woodward Ave., Detroit; 1616 Grand Ave.. Kansas City.

Dayton Inner Tire & Manufacturing Co., 17 Madison St., Dayton, O. (Dayton.)

Diamond Rubber Co., Akron O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Cataract Rubber Co., Wooster, O. (Cataract.)
Branches: Boston, New York, Providence.

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special, Motz Cushion.)
Branches: Boston, New York, Philadelphia, Pittsburg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright, G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.)
Branches: See Tires—Casings and Inner Tubes.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS. (See Cars, Commercial.)

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Caldwell Manufacturing Co., 1756 Cranston St., Providence.

TURNTABLES.

Beach Co., T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

Canton Foundry & Machine Co., Canton, O. (Universal.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VALVE GRINDERS.

Wall, J. H., 290 Hope St., Bristol, R. I. (Ford.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WELDING, STEEL.

Standard Welding Co., Cleveland.

WHEELS.

Eberly & Orris Mfg. Co., Mechanicsburg, Penn.

WIRES AND CABLES.

Diamond Rubber Co. of N. Y., Akron, O. (Diamond.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

BLUE RIBBON POLISHES

SHINE LIKE THE SUN

THE LARGEST METAL POLISH FACTORY IN THE WORLD

A Record Breaker

Fastest and Brightest

Leads Everywhere

The World Over

BLUE RIBBON
CREAM
METAL POLISH
FOR
SPEED
DURABILITY
BRILLIANCY

BLUE RIBBON
CREAM
METAL POLISH

Blue Ribbon Cream Metal Polish

It's a thick cream metal polish—an emulsion. The quickest and best for metals constantly exposed to the weather; best for inside work.

Does not settle; requires no shaking; leaves no sediment in crevices.

Only polish furnished in five or ten-gallon cans for garages, fire departments and other large users which gives perfect satisfaction.

It removes the TARNISH, not the METAL. A household necessity for cleaning and polishing all brass and metal trimmings and fixtures. Regarded by all large users and dealers everywhere as the ideal polish for all-around use and as a trade article.

Blue Ribbon Greaseless Cream Automobile Body Gloss and Furniture Polish

For body of any car. Keeps it like new. Maintains original gloss and finish. Revives and restores lustre adding new life to highly polished surfaces. Absolutely leaves no grease to catch dust. Also valuable for cleaning, preserving and brightening leather trimmings.

BLUE RIBBON
AUTOMOBILE
BODY GLOSS
FURNITURE POLISH

Manufactured By

International Metal Polish Company

QUILL STREET and BELT R. R.
INDIANAPOLIS, INDIANA

THE ACCESSORY —AND— GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., JANUARY, 1913. No. 8

AUTOMOBILE CHAMBER OF COMMERCE.

National Association of Manufacturers and Board of Trade Amalgamate to Form New Body---Interesting News Concerning the Industry and Trade.

The proposed amalgamation of the Automobile Board of Trade and the National Association of Automobile Manufacturers, which has been under discussion practically all of the past year, was brought to a definite head at the annual meeting of the former organization in New York during the progress of the pleasure car show. The report of the consolidation committee was accepted, nearly all of the 65 members of the Automobile Board of Trade being present and the vote being unanimous. It is understood that the executive committee of the National Association of Automobile Manufacturers has accepted the report for the members of that organization.

Under the terms of the report the amalgamated association will be known as the Automobile Chamber of Commerce, and will start its existence with some 110 manufacturers. It does not appear clear whether the two older organizations are to lose their identity, but the new will act in all matters affecting the united industry.

The Automobile Board of Trade has re-elected its old board of officers and directors as follows: President, Charles Clifton; vice president, C. C. Hanch; secretary, R. D. Chapin; treasurer, George Pope; general manager, H. A. Bonnell; directors, Charles Clifton, Pierce-Arrow Motor Car Company; C. C. Hanch, Nordyke & Marmon Company; S. T. Davis, Jr., Locomobile Company of America; Hugh Chalmers, Chalmers Motor Company; S. D. Waldon, Packard Motor Car Company; Wilfred C. Leland, Cadillac Motor Car Company; John N. Willys, Willys-Overland Company.

BECOMES CHIEF ENGINEER.

W. B. Engler Wins Promotion After Studying Truck Conditions in European Cities.

Announcement has been made by W. L. Day, vice president of General Motors Truck Company, Detroit, maker of G. M. C. trucks, of the promotion of W. B. Engler to the post of chief engineer with entire charge of experimental and development work. Preparatory to his new and larger responsibilities, Mr. Engler has passed the last three months abroad studying truck design as well as conditions surrounding motor truck service and operation in various European cities.

For the past three years Mr. Engler has been head of the engineering department of the General Motors Company's heavy duty gasoline truck plant at Owosso and previous to that was associated with the Olds Gas Power Company of Lansing, Mich.

R-C-H OFFICERS ELECTED.

J. F. Hartz Becomes President and R. C. Hupp Is Vice President.

At the annual meeting of the board of directors of the R-C-H Corporation, Detroit, maker of R-C-H cars, held at the plant, the following officers were elected: President and treasurer, J. F. Hartz; vice president, R. C. Hupp; secretary, C. P. Seider. These officers, with G. W. Rogers and J. G. Robertson, Akron, O.; John Kelsey and Joseph H. Clark, Detroit; G. Jahn of New York City and C. G. McCutcheon of Jackson, Mich., comprise the directorate. Mr. Jahn was elected to succeed F. M. Randall of Detroit, resigned.

The new president of the company, J. F. Hartz, is one of the best known and most successful business men of Michigan. He is president of the C. M. Hall Lamp Company, vice president of the Williams Bros. Company, president of the J. F. Hartz Company and interested in many other successful and well known Detroit concerns. Arrangements have been completed for ample financial backing for the R-C-H Corporation and plans made for an energetic sales campaign for the coming season.

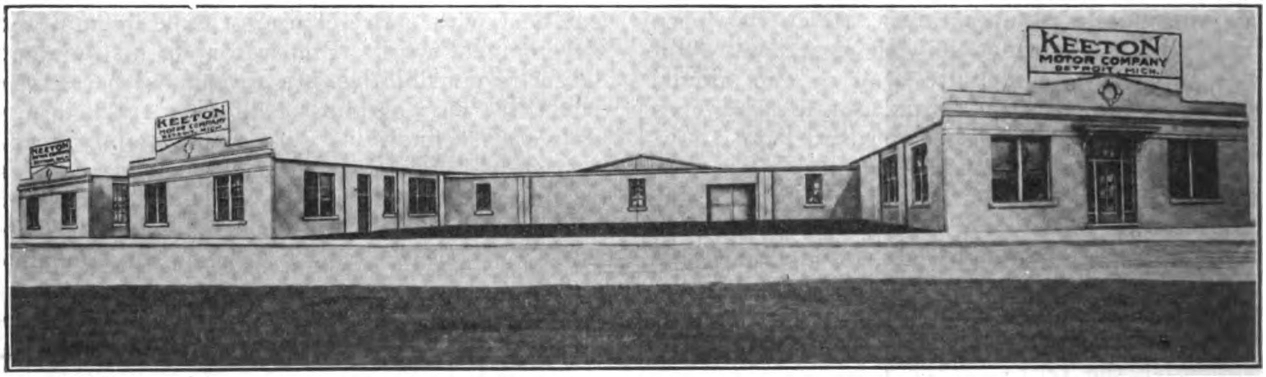
As previously announced, Peyton R. Janney, formerly of the General Motors Company, and with a splendid record both in the manufacturing and sales departments of the automobile business, became general manager of the company Jan. 1. Fred R. Bump continues as assistant general manager.

SECURES NEW FACTORY.

Keeton Motor Company Acquires Oliver Truck Plant in Detroit.

The Keeton Motor Company, Detroit, maker of Keeton cars, has purchased the plant formerly occupied by the Oliver Motor Truck Company at Breckenridge and Lawton avenues. The building affords 40,000 square feet of floor space and is well located for manufacturing and shipping purposes, being on the Michigan Central railroad. An accompanying illustration shows the present structure, which will be augmented in the near future by the erection of several substantial additions.

The officials of the Keeton company are: President, Forrest M. Keeton; vice president and sales director, William G. Houck; directors, C. D. Shaffer, Wilbur Brotherton and Norton Brotherton. F. Ed. Spooner, well known because of his long connection with the automobile industry as a director of publicity, has been appointed advertising manager.



Factory Buildings in Detroit Which Have Just Been Purchased by the Keeton Motor Company of That City.

TO REFINANCE LEXINGTON.

Connersville Company Offers Proposition to Satisfy Creditors and Enable Production.

The Connersville Securities, Connersville, Ind., a corporation composed of local capitalists, has offered the creditors of the Lexington Motor Car Company a proposition to purchase the claims against the company and to refinance it on a sound basis. The proposition is for 25 per cent. in cash 30 days after proper delivery.

The difficulty of the Lexington Motor Car Company arose from the failure to secure new capital after entering into a contract to produce cars worth $1,500,000 a year. A meeting of the creditors was called and a committee appointed. Nominal assets are placed at $134,000 and liabilities at $140,000.

SOMERVELL FOR HERRESHOFF.

Becomes General Manager with Intimate Knowledge of Production and Salesmanship.

The Herreshoff Motor Company has announced the appointment of C. Stuart Somervell as general manager of that company. Mr. Somervell until recently was manager of the Lycoming Foundry & Machine Company of Williamsport, Penn., automobile motor manufacturer, which business he established in those works. Among his other duties he personally attended to the sale of the factory output.

Mr. Somervell for the past three years has been in close touch with the automobile situation. He is a man of energetic personality and has had wide experience in the production and sales departments of various factory organizations. His knowledge has been gained through long years of the very best schooling and knowing, as he does, so intimately and in detail the production and sales departments of the manufacturing business, his appointment is a distinct gain to the organization of the Herreshoff Motor Company.

THE BAUER-LEWIS COMPANY.

Former Member of Oakland Purchasing Department to Manufacture Leather Supplies.

Frank Bauer and P. M. Lewis, both well known in Detroit automobile circles, have purchased the stock formerly held by L. A. Young in the Durable Company. As the Bauer-Lewis Company the concern will continue the manufacturing of automobile top straps, magneto boots, cross-arm boots and a line of other leather supplies.

The new officers of the company are: President, Frank Bauer; vice president, F. O'Brien; secretary-treasurer, P. M. Lewis. Mr. Lewis, under the former management was secretary and general manager of the concern. Mr. Bauer left the purchasing department of the Oakland Motor Car Company, Detroit, maker of Oakland cars, to accept the presidency of the Durable Company.

SECURES ADDITIONAL EQUIPMENT.

Cincinnati Time Recorder Company Proves a Factor in Automobile Industry.

The Cincinnati Time Recorder Company, Cincinnati, O., which has been engaged in the business of producing time recording devices for the past nine years, is proving a decided factor in the automobile industry, through the manufacturing of time clocks and systems which are applicable to the public and private garages. The cost accounting features of these instruments are of decided benefit to the operator of commercial vehicles, as well.

Since taking up this work the demand has been increased by large proportions, until the company recently found itself in a position where it was experiencing difficulty in keeping up with the orders. New equipment, which is expected to enable it to meet with all demands for some time to come, has been installed at an expenditure of $25,000, and with the opening of the new year the company announces it will be able to fill all orders promptly.

MOTOR HAULAGE EXPERT.

C. T. Myers Leaves General Motors Company to Become Special Consulting Engineer.

Cornelius T. Myers, who for the past two years has been mechanical engineer and chief engineer of the General Motors Truck Company, Detroit, maker of G. M. C. trucks, has severed his connection with the company. He is returning to the consulting work which he dropped to assist President Neal in caring for some of the engineering problems then confronting the General Motors Company.

When Mr. Myers completes some special work which he now has on hand, he will be in a position to carry on a consulting engineering practise in all lines of automobile activity, but particularly in the motor truck field. Among other things, he will make a specialty of reports to prospective purchasers on their local conditions with respect to the mechanical transport and on the particulars of the various machines on the market. His office is at present located at 49 Pingree street, Detroit.

BRIGHT SUCCEEDS HESS.

Latter Sells His Interest in Hess-Bright Concern to German Company.

F. E. Bright has become president of the Hess-Bright Manufacturing Company, following the purchase of all the stock owned by Henry Hess, by the Deutsche Waffen and Munitions Fabriken, Berlin, Germany, maker of D. W. F. ball bearings. He was formerly vice president and treasurer and now holds the controlling interest.

A. T. Bruegal is secretary and C. L. McCalla is treasurer of the concern. The German parent factory is being increased and extensive improvements to the American plant are being made.

BECOMES FACTORY MANAGER.

J. M. Smith Takes Charge of Production with Henderson Motor Car Company.

Although organized early last summer, the business of the Henderson Motor Car Company, Indianapolis, Ind., maker of Henderson cars, has reached such proportions that it has been found necessary to acquire a new addition, affording 55,000 square feet of floor space. J. M. Smith has been appointed factory production manager.

Mr. Smith is not new in the automobile field, having been employed in one of the large Detroit factories for several years as assistant superintendent in charge of production. He also spent three seasons with the Chatham Motor Car Company of Canada as production manager, and comes to the Henderson company from the Cole Motor Car Company, Indianapolis, where he has been factory manager.

Shortly before the new year the Henderson factory was closed to enable an inventory of the various departments and to rearrange the machinery, etc., in the new addition. An increased force of workmen began operations at the conclusion of this brief respite, and it is announced that the production will be doubled for January and February, and still further increased later in the season.

J. M. Smith, Factory Manager, Henderson Motor Car Company.

The Hartford Automobile Dealers' Association, Hartford, Conn., will hold its sixth annual display of motor cars, parts and accessories in the state armory, Feb. 8-15. This season the dealers will be assisted in the management of the exhibition by the First Infantry, C. N. G.

F. W. Dart, who has been in charge of the arrangements for past shows, will head the dealers' committee again this year. He is now engaged upon trying to find room for all who desire to make display, and even with the space available in the new armory it begins to look like a formidable task.

BRIDGEPORT'S ANNUAL SHOW.

Entire Space Already Allotted to Members of the Automobile Dealers' Association.

The annual automobile and motor boat show to be held March 3-8 at Bridgeport, Conn., will this year be one of the largest held in that state. The event will be staged in the Park City rink, which will furnish about 130,000 square feet of floor space.

At the first meeting of the Bridgeport Automobile Dealers' Association, under whose auspices the display will be held, the entire allotment was made, so anxious were the various exhibitors to secure space before it should be too late. B. B. Steiber is the active manager of the show.

PROMOTE RAMBLER MEN.

Business of the Company Makes Necessary Rearrangement of Executive Force.

With the coming of the new year several important additions have been made to the executive staff of the Thomas B. Jeffery Company, Kenosha, Wis., maker of Rambler Cross Country cars. The board of directors includes Charles T. Jeffery, Harold W. Jeffery and George M. Berry, while the officers of the company are: President and general manager, Charles T. Jeffery; vice president, Harold W. Jeffery; second vice president and treasurer, George M. Berry; secretary, Edward S. Jordan; assistant secretary, Edward S. Maddock.

Some of the promotions made at the annual meeting follow: Louis H. Bill of the Pacific Coast branch, assistant general manager; Harry E. Field, formerly in the New York branch, sales manager; J. W. DeCou, factory manager; J. Bjorn, assistant factory manager; G. H. Cox, assistant sales manager. All these men have been active in the selling of Rambler cars for a number of years. The business has grown to such proportions that it was decided to enlarge the executive force to cope with it, and those responsible for the immense growth of the concern were naturally chosen for promotion.

NEW CARBURETOR FACTORY.

Inventor Locates in Los Angeles After Long Distance Test Over the Road.

A new factory for the manufacture of the Jensen carburetor has just been established at Los Angeles, Cal., being located at 2413 South Grand avenue. The inventor is A. Rasmus Jensen of Milwaukee, Wis., who recently, with Mrs. Jensen and Otto S. Nick of Milwaukee, drove from that city to Los Angeles to test the product over the various mountain and valley roads. Although the trip was through eight states, the carburetor was not touched once during the journey.

Mr. Jensen has decided to locate his factory in California, with the result that the present quarters were secured immediately upon his arrival at Los Angeles. Free demonstrations are made to all who are interested in the invention. The carburetor is said to be absolutely automatic in its action, adjusting itself to heat and cold and to all changes of altitude, as well as to low and high speed of the motor. The mixture is controlled entirely by a thermostat, which expands and contracts under varying conditions, controlling automatically the amount of gasoline and air admitted to the intake manifold.

PARKER BECOMES PRESIDENT.

Elected to Head National Gas Engine Association at Its Convention in Indianapolis.

The National Gas Engine Association recently held a three-day convention in Indianapolis, Ind., and various matters of interest to the organization were considered. On the last day the annual election of officers was held and in the evening the convention closed with a banquet.

Following are the officers elected: President, O. C. Parker, La Crosse, Wis.; vice president, R. A. Oglesby, Indianapolis; treasurer, Otto M. Knoblock, South Bend, Ind.; secretary, H. R. Brate, Lakemount, N. Y.; executive committee, Otto M. Knoblock, South Bend; R. A. Oglesby, Indianapolis; M. H. Walker, Chicago; M. A. Loeb, Cincinnati, O.; O. C. Parker, La Crosse; E. J. Perkins, St. Joseph, Mich.; O. B. Isles, Indianapolis; H. W. Bolens, Port Washington, Wis.; C. O. Hamilton, Elyria, O.

FIRST CAR OWNED IN LYNN.

Now on Exhibit Beside Latest Chalmers Model in Whitten's New Salesroom.

Readers of the Accessory and Garage Journal will remember that the gasoline automobile designed by Max Hertel won a prize for starting from the seat at the Chicago Times-Herald race in 1895. This machine was later built as the Oakman by the Oakman Automobile Company, Greenfield, Mass. It appears that one of these was purchased by F. C. Cheever of Lynn, Mass., Nov. 10, 1899, and was the first automobile owned in Lynn. This car was recently on exhibition in the new salesroom of Charles E. Whitten, the Chalmers agent on Central avenue in that city.

Mr. Cheever supplies some interesting data concerning the car while it was in his possession. For instance, it appears that he paid $650 for it Nov. 10, 1899, and sold it July 27, 1901, for $350. That gives a depreciation of $300. He expended $50.24 for repairs, overhaul, new parts and labor; $17.76 for tires; $21.65 for gasoline, oil and batteries, and $25.35 for improvements, etc., making a total running expense of $115. He ran the car a total distance of 1625 miles, and the cost a mile figures out at about 25.5 cents.

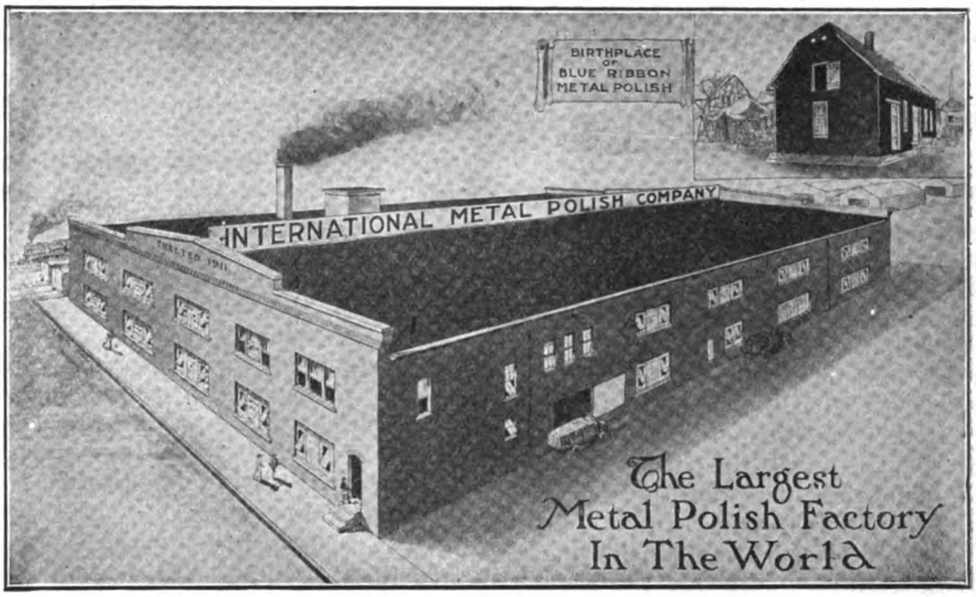
After Mr. Cheever sold the machine it passed to at least two other owners, but he finally bought it again, to retain it as a curiosity and because of the sentiment associated with its original ownership.

EIGHT YEARS OF GROWTH.

What It Has Done for Manufacturer of Blue Ribbon Metal Polishes.

Accompanying illustrations present the two extremes in the business life of the International Metal Polish Company, Indianapolis, Ind., the insert being a view of the building in which R. A. and Eugene Blackburn began the production of Blue Ribbon metal polishes eight years ago, while the main portion of the picture shows the present factory, said to be the largest in the world devoted to this purpose. It may be stated that the original small factory soon proved too small to meet the demand for the product, and for a time some of the work was accomplished under tents.

The new building is of concrete fireproof construction throughout and is well located on Quill street and the Belt railroad. It is of two stories, with 30,000 square feet of floor space, and the shipping facilities are such that the conditions are held to be ideal in this respect. As a further indication of the growth of the company it may be added that branches are located in the Moffalt building, 335 Broadway, New York City, and 1033 La Salle avenue, Chicago, while the Weinstock Nichols Company, San Francisco, acts as branch distributor on the Pacific Coast.


BIRTHPLACE OF BLUE RIBBON METAL POLISH
INTERNATIONAL METAL POLISH COMPANY
The Largest Metal Polish Factory In The World

Indicating Growth of International Metal Polish Company, Indianapolis, Ind., During the Past Eight Years.

Blue Ribbon polishes are made for metal, varnish and other purposes and are handled by leading jobbers in all cities. The company also enjoys a large export business. They will be exhibited at Chicago and Boston.

WILL DISTRIBUTE DRY CELLS.

Halliwell Concern to Take Over Entire Product of Standard Carbon Company.

The Halliwell Company, Los Angeles, Cal., of which C. E. and W. H. Halliwell are proprietors, has closed a big contract with the Standard Carbon Company of the same city, for its entire output of dry cells. The contract calls for the delivery of 3000 dry cells a day and these will be marketed through the different branches of the Halliwell Company.

To take care of this business two electrical specialty salesmen have been added to the Halliwell force. F. E. Overhiser will look after the country business, while A. E. Ravenscroft will handle the city trade.

AJAX TIRES IN GREAT BRITAIN.

Charles Y. Knight Is Perfectly Satisfied with Showing Made on His Car.

British roads with their surfaces of flint over which automobiles are driven much faster than in America, test automobile tires to the limit of severity. Low tire mileages are the rule and British motorists apparently expect nothing better from their native product. How well an American shoe withstands these conditions is shown by a letter written by Charles Y. Knight, inventor of the Knight motor, to Horace De Lisser of the Ajax-Grieb Rubber Company, New York City.

"I have completed 4300 miles on an Ajax tire, which I received from you last spring," he says. "I must say that taken all in all it is the most remarkable tire I have ever had on a car. Our average speed is at least 10 miles an hour greater on these hard roads, which act like sandpaper, than is possible on the average American roads. The remarkable thing about the Ajax tire is that during the 4300 miles that it has been running on the rear wheel it has not received from the road a single cut which penetrated to any great depth, apparently the result of the quality of rubber employed in its construction. The result is that the wear stands uniformly even all round and that it is still in good running condition and no doubt might be retreaded to last considerably longer. I am still using it and shall run it to destruction."

BRITISH ENGINEERS COMING.

Will Return Recent Visit Made by American Society During the Summer.

The invitation of the American Society of Automobile Engineers to the Institution of Automobile Engineers of England, to visit this country next spring has been extended to members of the Society of Motor Manufacturers & Traders, Ltd., and has been accepted by the latter. It is expected that the party visiting the United States from England will be greatly augmented as a result. A joint committee of the two English bodies is at work on the preparation of the programme, which will be full of interest.

A number of automobile factories will be visited, together with works producing steel, springs, tires, bodies and other details of the automobile industry, while three days will be passed on one of the largest passenger steamers of the Great Lakes during the annual summer meeting of the American Society of Automobile Engineers.

BOSTON SHOW IN MARCH.

Plans Perfected for Industry's Largest Exhibit in Two Sections.

Mechanics building, Boston, Mass., which for the past 10 years has housed the big Boston automobile show, will again this year present two separate exhibits. The pleasure car division of the industry will be represented during the week of March 8-15 and following this, from March 19-26, will be held the exhibition of commercial vehicles. The first show will be under the direction of the Boston Automobile Dealers' Association, Inc., while the truck display will be under the management of the Boston Commercial Motor Vehicle Association, Inc.

In the pleasure car division many new body designs will be seen and the show promises to surpass anything of its character ever held in this country. With the whole of Mechanics building at its disposal the Boston Commercial Vehicle Motor Association also will be able to present a thoroughly interesting exhibition. In connection with the truck show this year a special department will be set apart for the machine tool display. It has been impossible to do this industry justice in past years owing to lack of space, but the whole of department C will be devoted to it this year. Manager Chester I. Campbell has prepared an entirely new decorative scheme and is now busy considering applications for space at his office, 5 Park square, Boston.

NEW CARTERCAR MEN.

Several Changes in Personnel of Department Heads in Pontiac Concern.

The Cartercar Company, Pontiac, Mich., maker of Cartercar machines, is said to have made several changes in its factory organization. A. C. Leverton, formerly with the Brush Runabout Company, has become works manager, succeeding J. J. Hartley, who goes to Philadelphia. A. A. Lehr, formerly with the Studebaker Corporation, has succeeded H. D. Evans as purchasing agent, and W. D. Block, recently with the Detroit office of the General Motors Company, becomes comptroller.

Donald M. Ferguson, who was formerly connected with the Studebaker Corporation, has been made chief engineer, E. J. Farkas having resigned to open an office of his own at Detroit. Harry R. Radford, who has been general manager for some time, and who is well known throughout the industry, will continue in that important position.

NEW STUDEBAKER TRUCKS.

Plans Laid for Enlarged Production of Both Gasoline and Electric Vehicles.

The Studebaker Corporation, Detroit, maker of Studebaker pleasure and commercial vehicles, will greatly increase its commercial department for 1913 and will manufacture a complete line of gasoline and electrically propelled motor trucks. During 1912 the company produced more motor driven commercial cars than ever before in its history and the output this year is expected to greatly exceed this.

A complete line of electric trucks and two new gasoline machines were on exhibition at the New York shows and as soon as the company succeeds in completing its truck manufacturing organization, it will market complete lines from light delivery wagons to trucks of six tons capacity, including all the intervening types, both gasoline and electric. The latter vehicles have, to a large extent, been redesigned and one model is equipped with worm drive.

HINDLEY GEAR COMPANY.

Organized to Take Over Manufacture of Worm Gearing of Hindley Type.

The designing and manufacturing of worm gearing of the Hindley type, which has been a branch of the business conducted by the Otis Elevator Company, Philadelphia, Penn., has been discontinued by that company as such and since Jan. 1 has been made by the Hindley Gear Company, a corporation organized under the laws of Pennsylvania.

The increase in this line of work has reached such proportions that the Otis Elevator Company's officials believed their customers would be better served by having a separate concern take care of the Hindley worm gearing, particularly in view of the increased demand for this type in commercial vehicles. It is understood that the Otis Elevator Company is behind the new corporation formed to manufacture these gearings.

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

MORE CAPITAL FOR BAILEY.

Rapidly Increasing Business Makes Necessary Provision for Enlarged Production Facilities.

So rapidly has the business of the S. R. Bailey Company, Inc., Amesbury, Mass., maker of Bailey electric vehicles, grown that to increase the production facilities of the concern it is understood that $100,000 worth of preferred stock has been issued. The company plans to gradually increase its scope and the factory will later be enlarged considerably.

The firm has been successful beyond expectations and many orders for its runabout have been received from electric light companies in various cities. It is planned to increase the working force of the plant as fast as the business warrants.

NEW WAVERLEY YEAR BOOK.

For some time the Waverley Company, Indianapolis, Ind., maker of Waverley electric machines, has occupied a foremost position in the industry with its annual year book. The issue for 1913 carries the innovation one step further removed from the formal catalogue by adding a calendar for each month, the object being to direct the reader's attention the more forcibly to the advantages of a car whose usefulness is circumscribed by no limitations of climate, season or weather conditions.

Carrying out this idea colored illustrations present Waverley cars in use at all seasons of the year, and the page assigned to each month presents hints that will aid the owner in enjoying nature in its varying moods and forms of life. That portion devoted to description of the models themselves is most complete in every detail, the text being supplemented with numerous illustrations of the parts to which attention is called.

As an example of the printer's art the book is in full keeping with the exemplification of the manufacturer's art represented in the various models of the Waverley electric pleasure car. No suggestion that can be of value to the prospective purchaser has been omitted.

BOYER SUSPENSION BEARINGS.

Product of Sandusky Concern Embodies New and Interesting Constructional Features.

A new anti-friction bearing, for which many advantages are claimed, is being marketed by the Suspension Roller Bearing Company, Sandusky, O. It is made both in roller and ball types under the name of Boyer suspension bearing, and the company calls particular attention to the latter, stating that by the suspension system all of the balls are actual load carriers at all times, preventing possible crushing of them.

This is based on the claim that the load is not supported by the balls in one direction at right angles to the load pressure line, but at an acute angle. It is held that the load falls on the side of the ball and not on top or centre. In other words, in supporting the load, the balls rotate with an inclined axis.

The maker points out that the suspension principle logically withstands both radial and thrust pressures, while by distributing the load to all balls, the strain on each member is lessened by about 500 per cent. To effect this movement, the balls are placed between two similar raceways instead of having the customary raceway encircling them, with a companion raceway inside the circle of balls or rollers.

It is stated that the grit nuisance is obviated by the action of the balls, their movement tending to work foreign substances out between the raceways, instead of retaining them along the line of travel of the balls. A quality of the bearings emphasized is that only sufficient lubrication to prevent rusting is necessary. The bearings are made in different sizes for motor car construction, also for line and countershaft hangers and in various other forms.

MAGNETOS IN CARLOAD LOTS.

Remy Electric Company Is Thus Compelled to Fill Orders from Two Customers.

Few persons realize that the volume of business done by one Indiana accessory firm is greater—that it requires more men and a bigger factory—than some well known motor car manufacturing concerns. The Remy Electric Company's plant at Anderson affords several hundred thousand feet of floor space and employs over 1000 men, who work in day and night shifts, in producing ignition, lighting and starting systems.

During October this concern shipped 13,055 magnetos, which is at the rate of 156,660 a year. About 14,000 were shipped in November. The production reaches as high as 875 complete magnetos and coils a day. The instruments are delivered to two firms, the Willys-Overland and Buick, in carload lots.

Two new books relating to the care and operation of motor cars have been issued recently by the American School of Correspondence, Chicago, these being prepared by well known members of the Society of Automobile Engineers, Victor Lougheed and Morris A. Hall. One is entitled "The Gasoline Automobile" and the other, "Care and Operation of Automobiles." Both are well illustrated and are intended to reach a class of motorists who would not be interested in the more technical discussions. "The Gasoline Automobile," by Lougheed and Hall, presents the development and present status of the car, and takes up all the integral components of the machine and their functions. The other book, by Hall, combines the subject of private garages and repairs, with automobile driving.

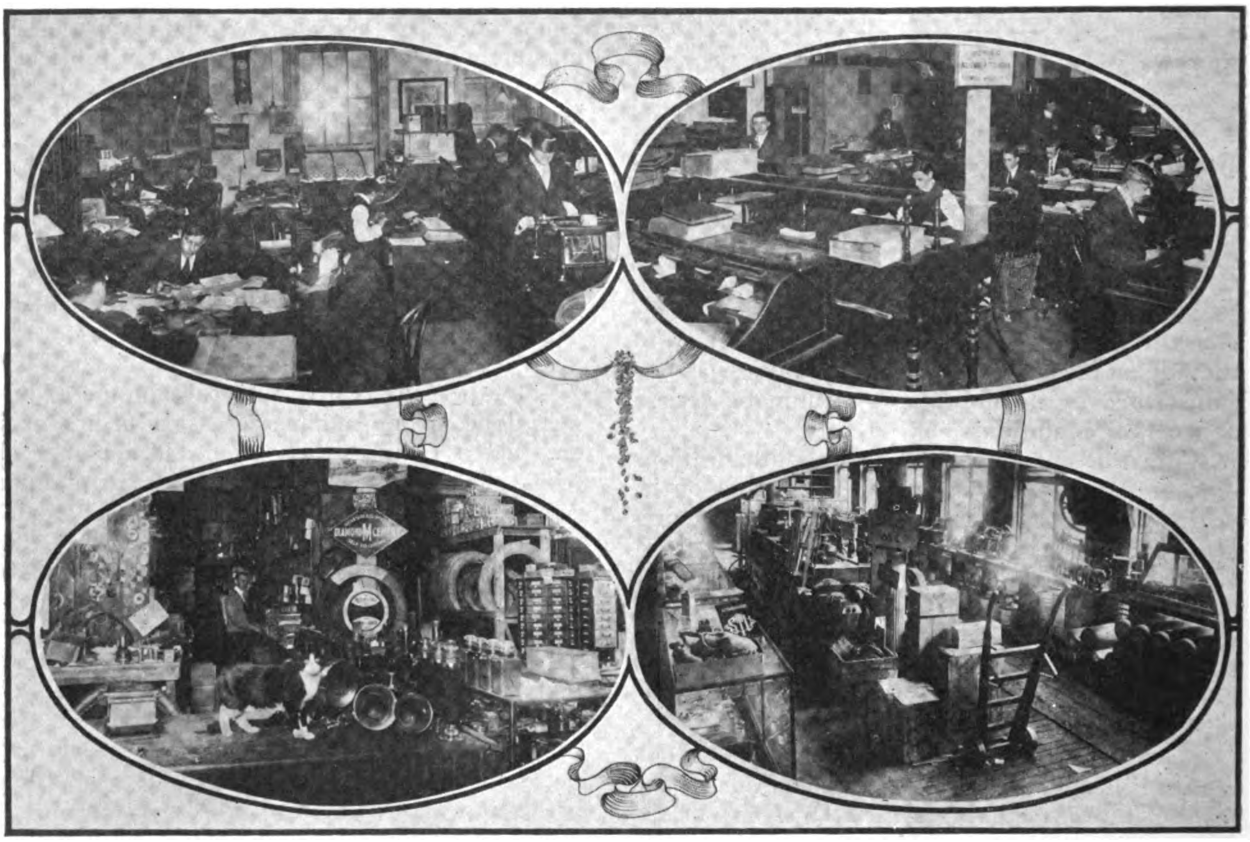
GROWTH OF PIONEER ACCESSORY HOUSE.

ONE of the committee of eight which made the arrangements for the first national automobile show in Madison Square Garden, New York City, 13 years ago, was Chas. E. Miller, pioneer dealer in automobile accessories. Soon after the appearance of the first practical gasoline machines, Mr. Miller, who was at that time and had been for some years engaged in conducting a supply house for bicycle sundries in New York City, became interested in such equipment as his judgment indicated would be suitable for use on the horseless carriage. The industry is indebted in no small measure to his business foresight in this connection.

It was during the annual bicycle show in Madison Square Garden during the fall of 1899, that a few automobiles, loaned by their owners, were displayed as an added attraction. As a result, there arose a demand for more extended exhibition the following year, and inasmuch as Mr. Miller was well established in this location, his advice was eagerly sought and generously given in connection with the plans which led up to this initial show. Moreover, he was the third member elected by the National Association of Automobile Manufacturers.

Mr. Miller began his business with automobile accessories by selecting such bicycle equipment as could be made to apply to the new vehicles, but he was not long content with this plan. He sought out the manufacturers of special fittings, acting first as a general jobber and later as the special representative of different producers. This very naturally brought him into peculiar relations with the trade, and as foreign makers were producing accessories of undoubted value, he soon became an importer as well. Still later, as American inventors began experimentation in this field, Mr. Miller, who by this time had come to be considered more or less of a specialist, was called upon for his judgment relative to the practicability of the devices, and often saw fit to assist in their production. In this manner he became a manufacturer. And as the demand for American fittings and supplies was created abroad he took up the exportation of such as he felt would meet with the approval of foreign motorists.

Such, in brief, is the business history of Chas. E. Miller, jobber, importer, manufacturer and exporter. Accompanying illustrations show the interior of the Miller headquarters at 97-103 Reade street, New York City, where every detail of the business transacted in this main house and the 15 branch houses in nine states receives his personal attention. The branches are located as follows: Three in New York City, and one each in Brooklyn, Buffalo and Albany, N. Y.; Boston and Springfield, Mass.; Hartford, Conn.; Philadelphia, Penn.; Newark, N. J.; Detroit, Mich.; Cleveland, O.; Atlanta, Ga., and New Orleans, La.



Headquarters of Chas. E. Miller, New York City: Upper Views Indicate Convenient Appointments in Business Office; Lower, Attractive Arrangement of the Salesrooms, with the Miller Cat in the Foreground at the Left.

In one of the accompanying photographs, Mr. Miller's black and white cat occupies a prominent position, and this is quite appropriate since this cat was brought up among the employees from a kitten, and very naturally has inherited much of the enthusiasm of the office force. It not only can sit up, retrieve and perform a large number of tricks, but the Miller establishment needs no clock to learn when it is lunch time, since it is its chief duty to announce this fact. It also includes the role of office boy, in a measure, as will be borne out by the regular patrons who have been greeted by it for years.

"Try Miller" has become a trade slogan, particularly in its application to any special line of accessories the merits of which have been firmly established, since Mr. Miller makes it a practise not to handle any except those in which he has undoubted confidence. Each of the branches is as well stocked in quality as the main store, though not as heavily in quantity, the purpose being to give the dealers of the section the benefit of the Miller purchasing methods and resources.

MORE SPACE AT CHICAGO.

General Manager Miles Secures Wilson Building for Overflow Department.

Many belated applicants for space at the 1913 Chicago automobile show, who have been greatly disappointed because of the lack of room in the Coliseum, Annex and First Regiment armory during either the first or second week of the display, have been given an unexpected opportunity to make exhibit.. General Manager Samuel A. Miles of the National Association of Automobile Manufacturers, under whose direction the show will be held, announces that he has acquired the Wilson building, adjoining the Annex on the south, and practically the same in size. The floors are free of all obstructions and will make an admirable addition to the display room heretofore secured.

Plans for the decorative scheme for the show have been completed, and the effect will be entirely different from any previous show of this character in America. Cathedral glass and stained windows will play a prominent part in the treatment. The pleasure vehicle section will be held Feb. 1-8 and the commercial car section, Feb. 10-15. The list of exhibitors as reported recently indicates the following: Pleasure cars. 102; business vehicles, 77; accessory concerns, 244.

VAUGHAN COMPANY INCORPORATED.

Expected to Take Over Kingston Plant for Production of Vaughan Cars.

The Vaughan Motor Car Company has been incorporated in New York State and is expected to take over the plant and equipment of the Woods Manufacturing Company, Kingston, N. Y., and to continue the manufacture of the Vaughan cars. The capital of the new concern is $1,000,000. It is proposed to manufacture 500 machines in 1913.

The new company will have $300,000 of cumulative preferred stock and $700,000 of common stock. Thus far no announcement of the personnel of the company has been made, or of the definite plans of the concern beyond the brief statement above outlined. The news of its formation is all the information offered to the public at this time.

SELF-VULCANIZING PATCHES.

Security Company's Product Held to Facilitate Repairs to Inner Tubes.

The Security Company, 14 Shingiss street, Pittsburg, Penn., is marketing the Security self-vulcanizing patches which make it possible to repair punctured or blown-out inner tubes without any equipment other than a little gasoline for cleaning the tube.

The patches are prepared with a self-vulcanizing coating over which is placed a protective cover. When a patch is to be employed the tube is cleaned with gasoline, the cover to the patch displaced and the self-vulcanizing surface moistened with a little of the fuel. The patch is then applied in the usual manner and the company states that the best test of sticking qualities is to try to remove it after a few miles of service.

The patches are made of red Para rubber, molded to a feather edge and coated as stated. Each cover is provided with an improved ear member for making easy the work of removal. The patches come in sets of 15, in a screw top box, and are inexpensive.

The company also manufactures patches for motorcycles and these are put up in a strong, indestructible rope paper, string fastening envelopes, making for convenience in storing on the machine. Full information will be forwarded upon request.

PRESENTED WITH LOVING CUP.

Flint Friends of President Nash of General Motors Company Testify to Their Esteem.

C. W. Nash, the newly elected president of the General Motors Company, to succeed Thomas Neal, resigned, was presented with a loving cup by his friends in Flint, Mich., where he has been general manager of the Buick Motor Company the past two years, at a recent banquet given by the Flint Board of Commerce. The event was attended by 200 men, including guests from New York, Chicago and other metropolitan centres.

The speakers reviewed Mr. Nash's career from the farm to his present position and testified to the esteem in which he is held by his business associates. A few days later Mr. Nash was the guest of honor at a banquet in Detroit, given by the officers of the General Motors Company.

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BILL GIVES BROAD POWER.

Among the first bills to be filed with the Massachusetts legislature at the present session was one introduced by Representative Fred P. Greenwood of Everett, which provides that a person convicted of operating an automobile while under the influence of liquor shall be liable to imprisonment for not less than 30 days nor more than one year, and shall forfeit his license forever. There does not appear to be any special provision for the first offense.

Representative Greenwood also has introduced a bill prohibiting the use of a device upon automobiles by which the operator may shut off the tail light without leaving his seat.

CALIFORNIA'S PROPOSED LAW.

The Automobile Club of California is taking deep interest in the bill introduced into the legislature of that state by Assemblyman Milton L. Schmitt of San Francisco, who hopes the commonwealth will benefit to the extent of $500,000 a year in license fees, etc. At present the registration fee in California is merely nominal.

The Schmitt bill provides the following schedule of fees: Cars of 25 horsepower and less, $5; 25-35, $10; 35-50, $15; more than 50, $20; motorcycles, $2; commercial vehicles, $5. Vehicles, other than those used exclusively for commercial purposes, licensed for more than four consecutive fiscal years, are thereafter to be registered at one-half fees.

A similar bill failed to meet the approval of the governor last year. Motorists objected to its provisions because old cars were compelled to pay the same fees as new ones. It would appear that an attempt were made to cover this point in the four-year clause and copies of the bill are being sent to owners in an effort to secure their approval of it.

AMENDMENTS IN TEXAS.

At a recent meeting of the Dallas Automobile Club, Dallas, Tex., all the representatives-elect in the county were present to discuss, with some 75 members of the organization, proposed amendments to the motoring law of that state. The subject of good roads legislation also was brought up. The amendments provide as follows:

1—To make the use of a motor vehicle on a public highway without the consent of the owner a crime punishable by imprisonment for not less than one year nor more than seven years.

2—That vehicles using the public highway after dark shall display a light of sufficient character to make them known at a distance of 200 feet, front and rear.

LIGHTS IN NEW JERSEY.

The statutes of New Jersey provide that "every vehicle drawn by horse, horses or other beasts shall carry during the period of 30 minutes after sunset and 30 minutes before sunrise, and whenever fog renders it impossible to see a long distance, at least one lighted lamp, which said light shall be of such nature and so displayed that it may be seen both from a point at least 250 feet in the direction towards which the vehicle is proceeding and from a point at least 250 feet in the direction from which the vehicle is proceeding." Of course, every automobile is required to carry at least two lighted lamps, similarly visible, during the same period.

A recent decision in the courts of Camden county will prove of interest to motorists and others. The night of March 29, 1912, a motorman of a trolley car ran into a truck wagon, completely demolishing it, killing one of the occupants and injuring the other. In the trial for manslaughter, the motorman and conductor set up that no light was displayed on the rear of the wagon. This defense proved sufficient for the jury, and the car crew was acquitted. Whether or not this interpretation of the law would apply in the case of an automobile which accidentally ran down an unlighted vehicle in New Jersey may be open to question, but the decision is bound to have its effect upon future legal actions in that commonwealth.

Mechanical Pointers *for* Garagemen *and* Repairmen

FIGURING AREAS OF CIRCLES.

In rebuilding cars, such as changing a touring machine into a roadster, for instance, the repairman is required to calculate the areas or circumferences of circles when planning the fuel tank, etc. Usually the tinsmith is called upon to give capacities for given dimensions and after having obtained these the owner decides that he will fit a tank carrying a larger supply of fuel, necessitating another visit to the tinsmith.

To obtain the capacities the area of a cylinder of a tank multiplied by its length gives its volume or capacity. To ascertain the circumference of a circle multiply the diameter by 3.1416. This is the constant which is denoted by the Greek letter π (pronounced "pi" like "pie.") The circumference of a circle 34 inches in diameter is secured as follows: 34x3.1416=106.81 inches. For instance: A car having 34-inch tires will travel 106.81 inches to complete one revolution of the wheel.

To find the area of a circle from its diameter, multiply the square of the diameter by one-quarter of the constant π. One-fourth of 3.1416 is .7854. If D represents the diameter, the area equals D^2x.7854, or area equals DxDx.7854.

The area of the head of a piston five inches in diameter is ascertained as follows: 5x5x.7854=19.635, and the piston displacement of a cylinder of that bore is 19.635xstroke. Assuming that the stroke is five inches the piston displacement would be 19.635x5=98.175 cubic inches for one cylinder.

To obtain the piston displacement of multiple-cylinder motors multiply that of one by the total number of cylinders. For example: The piston displacement of one cylinder having a five-inch bore and stroke is 98.175 cubic inches and that of a four-cylinder motor would be 4x98.175=392.7 cubic inches. Cylinders of different sizes may be figured similarly.

An accompanying table gives the circumferences and areas of circles of varying diameters from .015625 inch to 13.5 inches inclusive. To employ the table: Find in the first, fourth, seventh or 10th columns the diameter in inches of the circle, the circumference or area of which

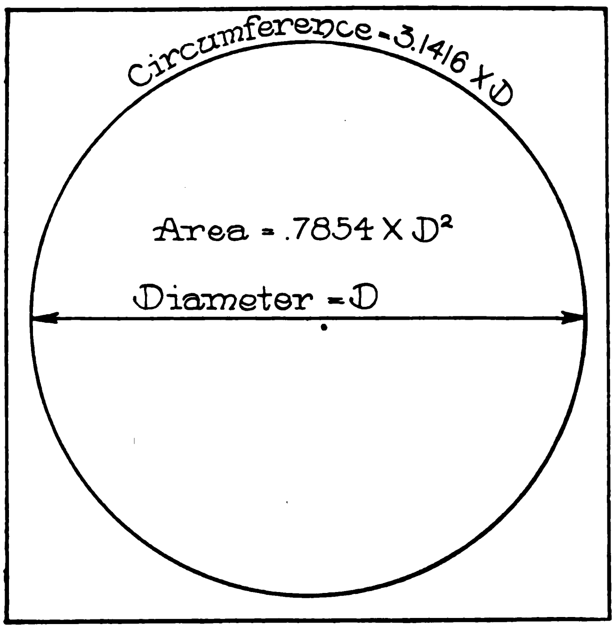
CIRCUMFERENCES AND AREAS OF CIRCLES

Diam. Inch	Circum. Inch	Area. Sq. In	Diam. Inch	Circum. Inch	Area. Sq. In.	Diam. Inch	Circum. Inch	Area. Sq. In.	Diam. Inch	Circum. Inch	Area. Sq. In.
1/64	.04909	.00010	1 11/16	5.3014	2.2365	4 7/16	13.941	13.941	8 1/4	25.918	53.456
1/32	.09818	.00077	3/4	5.4978	2.4053	1/2	14.137	15.904	3/8	26.311	55.088
3/64	.14726	.00173	13/16	5.6941	2.5802	9/16	14.334	16.349	1/2	26.704	56.745
1/16	.19635	.00307	7/8	5.8905	2.7612	5/8	14.530	16.800	5/8	27.090	58.426
3/32	.29452	.00690	15/16	6.0868	2.9483	11/16	14.726	17.257	3/4	27.489	60.132
1/8	.39270	.01227	2	6.2832	3.1416	3/4	14.923	17.728	7/8	27.882	61.862
5/32	.49087	.01917	1/16	6.4795	3.3410	13/16	15.119	18.190	9	28.274	63.617
3/16	.58905	.02761	1/8	6.6759	3.5466	7/8	15.315	18.665	1/8	28.667	65.397
7/32	.68722	.03758	3/16	6.8722	3.7583	15/16	15.512	19.147	1/4	29.060	67.201
1/4	.78540	.04909	1/4	7.0686	3.9761	5	15.708	19.635	3/8	29.452	69.029
9/32	.88357	.06213	5/16	7.2649	4.2000	1/16	15.904	20.129	1/2	29.845	70.882
5/16	.98175	.07670	3/8	7.4613	4.4301	1/8	16.101	20.629	5/8	30.238	72.760
11/32	1.0799	.09281	7/16	7.6576	4.6664	3/16	16.297	21.135	3/4	30.631	74.662
3/8	1.1781	.11045	1/2	7.8540	4.9087	1/4	16.493	21.648	7/8	31.023	76.589
13/32	1.2763	.12962	9/16	8.0503	5.1572	5/16	16.690	22.166	10	31.416	78.540
7/16	1.3744	.15033	5/8	8.2467	5.4119	3/8	16.886	22.691	1/8	31.809	80.516
15/32	1.4726	.17257	11/16	8.4430	5.6727	7/16	17.082	23.221	1/4	32.201	82.516
1/2	1.5708	.19635	3/4	8.6394	5.9396	1/2	17.279	23.758	3/8	32.594	84.541
17/32	1.6690	.22166	13/16	8.8357	6.2126	9/16	17.475	24.301	1/2	32.987	86.590
9/16	1.7671	.24850	7/8	9.0321	6.4918	5/8	17.671	24.850	5/8	33.379	88.664
19/32	1.8653	.27688	15/16	9.2284	6.7771	11/16	17.868	25.406	3/4	33.772	90.763
5/8	1.9635	.30680	3	9.4284	7.0686	3/4	18.064	25.967	7/8	34.165	92.886
21/32	2.0617	.33824	1/16	9.6211	7.3662	13/16	18.261	26.535	11	34.558	95.033
11/16	2.1598	.37122	1/8	9.8175	7.6699	7/8	18.457	27.109	1/8	34.950	97.205
23/32	2.2580	.40574	3/16	10.014	7.9798	15/16	18.653	27.688	1/4	35.343	99.402
3/4	2.3562	.44179	1/4	10.210	8.2958	6	18.850	28.274	3/8	35.736	101.62
25/32	2.4544	.47937	5/16	10.407	8.6179	1/8	19.242	29.465	1/2	36.128	103.87
13/16	2.5525	.51849	3/8	10.603	8.9462	1/4	19.635	30.680	5/8	36.521	106.14
27/32	2.6507	.55914	7/16	10.799	9.2806	3/8	20.028	31.919	3/4	36.914	108.43
7/8	2.7489	.60132	1/2	10.996	9.6211	1/2	20.420	33.183	7/8	37.306	110.75
29/32	2.8471	.64504	9/16	11.192	9.9678	5/8	20.813	34.472	12	37.699	113.10
15/16	2.9452	.69029	5/8	11.388	10.321	3/4	21.206	35.785	1/8	38.092	115.47
31/32	3.0434	.73708	11/16	11.585	10.680	7/8	21.598	37.122	1/4	38.485	117.86
1	3.1416	.7854	3/4	11.781	11.045	7	21.991	38.485	3/8	38.877	120.28
1/16	3.3379	.8866	13/16	11.977	11.416	1/8	22.384	39.871	1/2	39.270	122.72
1/8	3.5343	.9940	7/8	12.174	11.793	1/4	22.776	41.282	5/8	39.663	125.19
3/16	3.7306	1.1075	15/16	12.370	12.177	3/8	23.169	42.718	3/4	40.055	127.68
1/4	3.9270	1.2272	4	12.566	12.566	1/2	23.562	44.179	7/8	40.448	130.19
5/16	4.1233	1.3530	1/16	12.763	12.962	5/8	23.955	45.664	13	40.841	132.73
3/8	4.3197	1.4849	1/8	12.959	13.364	3/4	24.347	47.173	1/8	41.233	135.30
7/16	4.5160	1.6230	3/16	13.155	13.772	7/8	24.740	48.707	1/4	41.626	137.89
1/2	4.7124	1.7671	1/4	13.352	14.186	8	25.133	50.265	3/8	42.019	140.50
9/16	4.9087	1.9175	5/16	13.548	14.607	1/8	25.525	51.849	1/2	42.412	143.14
5/8	5.1051	2.0739	3/8	13.744	15.033						

is desired. Opposite the diameter in the next column will be noted the circumference of the circle of that diameter, and in the next column to the right will be found the area of that circle.

For example: It is desired to find the circumference and area of a circle five inches in diameter. The column diameter is located in the table and the figure five found. Opposite it is given in the circumference column the circumference which is 15.708. Another column is marked area and that of a five-inch diameter circle is 19.635, in square inches. Having obtained the area in square inches it is an easy matter to ascertain the piston displacement by multiplying the area by the stroke, five inches. For example, 19.635x5=98.175 cubic inches for one cylinder. For four cylinders it would be 98.175x4=392.7.

It will be noted that circumferences and areas of circles up to 27 inches in diameter may be secured from the table, though only those up to 13.5 inches diameter are given. For circles between 13.5 and 27 inches diameter, divide the diameter by two and multiply the corresponding circumference by two and the corresponding area by four. For instance: The diameter of the circle is 20 inches. This divided by two equals 10, the circumference of which is 31.416. This multiplied by two gives 62.92, the area of which is 78.54. This multiplied by four equals 314.16, the area desired.



Illustrating the Measurement of Circles to Obtain Areas, Etc.

PREVENTING RUBBER HOSE KINKS.

With the modern automobile the repairman does not experience any difficulty in replacng worn rubber water tubing with new as the connections are usually free from serious bends. On some types of old motors, however, the hose must be carried in such manner that a heavy grade tubing, having thick walls, must be employed else the pipe will kink badly and impede the circulation of water. Fitting the hose is a difficult task and to make the connections watertight is also troublesome.

A light tubing may be employed and in addition to being easier to handle is cheaper. It is interesting to note that the rubber manufacturers are marketing a durable light hose for this work and if it has a tendency to kink it may be prevented by using a coil of spring wire, a method which is utilized on locomotives.

It consists of winding and inserting within the hose the coil of wire which is made in the following manner: Take a piece of round metal, a pipe or iron member, about .25 inch smaller in diameter than the inside diameter of the hose. Cut a small slot in the end of the winding member and in the recess secure one end of the wire then wind it by retaining the rod member in the vise. The rubber tubing is then slipped over the wound spring, the latter released and the rod withdrawn. The coils will expand, filling the hose and will prevent its kinking. The gauge of wire employed should be stiff enough to withstand bending, depending upon the service of the rubber hose.

BENT FAN BLADES CAUSE HEAT.

There are a number of conditions which will cause heating of the motor, but a new one is pointed out by a driver of a commercial car who cares for his own machine. The motor became very warm, especially when operating on the low gear, and thinking perhaps that the pump was not working properly or the water pipes were clogged, these members were examined, but found to be in good condition. Various other inspections were made without discovering the cause of trouble. In lifting the hood the operator noted that the volume of air forced back from the fan was very small and an examination of the fan disclosed the fact that the blades were so bent that they were of little service. The pitch of the vanes was changed and after a little experimenting they performed their work properly and the heating symptoms disappeared.

LIGHTING THE WASHSTAND.

The lighting facilities of some garages are very poor insofar as the washstand is concerned and when the latter is installed after the building has been wired for electricity, the washer experiences difficulty in securing sufficient illumination. While lamps of the overhead type are generally satisfactory they do not light up the wheels and sides of the machine and frequently the discriminating owner is heard to complain that his automobile was only half washed.

A proprietor of a garage who installed a washstand on the main floor contrived the lighting board shown at Fig. 1 A. As a result his washer is provided with ample light and has no opportunity to make excuses if complaints are received relative to his work.

The panel was constructed easily, the material being two smooth boards about five feet long, six or seven inches wide and .625 inch thick, although these dimensions may be altered to suit convenience of stock and location. The boards were joined as indicated at B. Lamp sockets were attached and wired and the interior of the panel was coated with white enamel paint, which formed a good reflector.

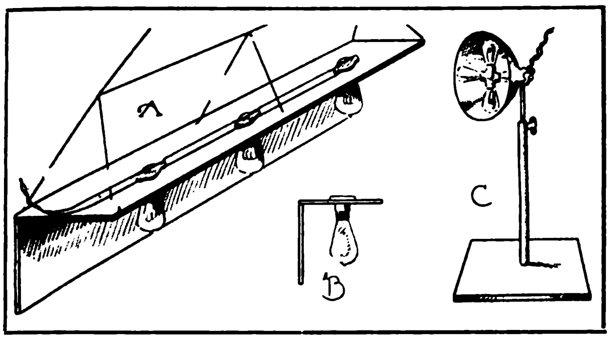


Fig. 1—Inexpensive and Easily Constructed Lighting Panel for the Washstand: A, Showing Method of Suspension; B, End View of Panel; C, Adjustable Stand Constructed from Music Rack.

Two of these panels were made, one for either side of the machine, and they were fitted with suitable rope and pulleys so that they could be raised to the ceiling when not being utilized and lowered when washing was to be done. As the members were adjustable to any desired height the running gear was as well lighted as the body, enabling the workman to perform his work satisfactorily.

At C is presented a suggestion for a lighting stand. It comprises an old music rack, having an adjustable rod to which is secured a reflector which could be of such size as to permit of the use of a group of four lamps. The rack could be mounted upon a wooden base and with a sufficient length of flexible cord and connecting plug, the device could be moved to any desired position. The design is similar to the side lights utilized upon the stage. Such an arrangement should prove of value in the repair shop where considerable overhauling has to be done at night.

BUSHING VALVE GUIDES.

One of the sources of auxiliary air is the valve guides. When provision is not made for replacing the worn bushings with new ones and the guides are integral with the cylinder casting the repairman is called upon to either bush the parts or true the opening, make and fit new valve stems. The amount of wear, cost, etc., would have to be considered, of course.

Steel tubing may be procured in varying inside and outside diameters for bushings and with a four-cylinder car eight bushings will be required, the measurements depending upon the design of the motor. Assuming that the inside diameter of the bushing when finished should be .375 inch, the diameter of the valve stem, the walls of the bushing should be approximately .0625 inch thick, outside diameter totalling .5 inch.

As the opening of the tubing is not always concentric with the outside diameter, before drilling or reaming out the bushings in the cylinders it is advisable to true up the bushings. This may be accomplished by placing on an arbor of the lathe and skimming off a trifle from the outside of the tube.

Previous to fitting the bushings to the cylinders a jig should be constructed so that an accurate hole may be assured when drilling or reaming. The jig may be made fitting a bushing to the opening of the spark plug cap as shown at Fig. 2. The bushing should be threaded to fit the opening as shown in the sketch, and should have an inside diameter equal to that of the hole to be drilled or reamed for the reception of the tube bushing. This will insure that the holes drilled or reamed will be accurate.

When the work of preparing the openings has been completed, the bushings should be inserted, making a drive fit so that the walls of the tubing will be compressed slightly, permitting of reaming or drilling for accuracy and for a close fit of the valve stems.

For drilling the tubes another bushing will be needed and it should fit inside the threaded member as illustrated. Before employing the spark plug cap make sure that its hole is concentrically accurate, and if not a special cap will have to be made if a good job is to be secured.

After the bushings have been drilled and the valve stems fitted properly, the former will have to be secured in place. This may be accomplished by drilling a small hole, .125 or .1875 inch, through the guide and into the bushing. The point of the drill should just enter the wall of the tubing and the recess should be just deep enough so that the screw will grip easily.

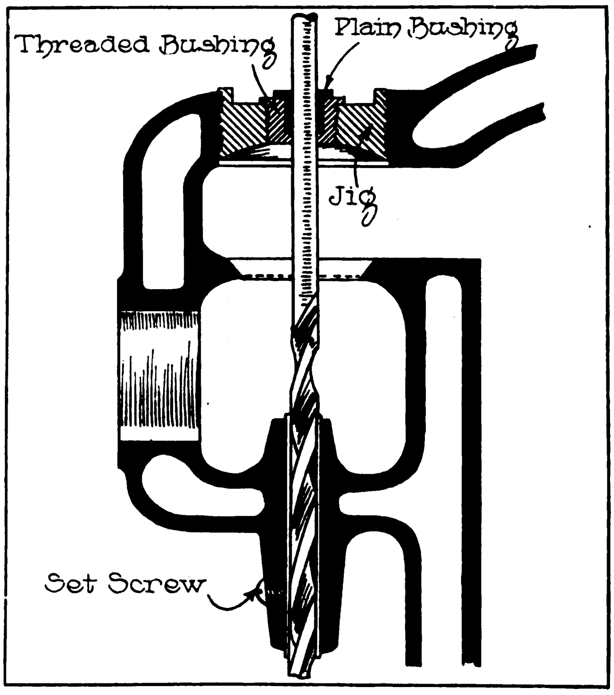


Fig. 2—Rebushing Worn Valve Guides with Standard Steel Tubing.

The thread must be such that it will grip the screw firmly and the latter should have a taper point. Care should be exercised that in screwing up the retaining member its point does not crush the walls of the bushing, which are thin.

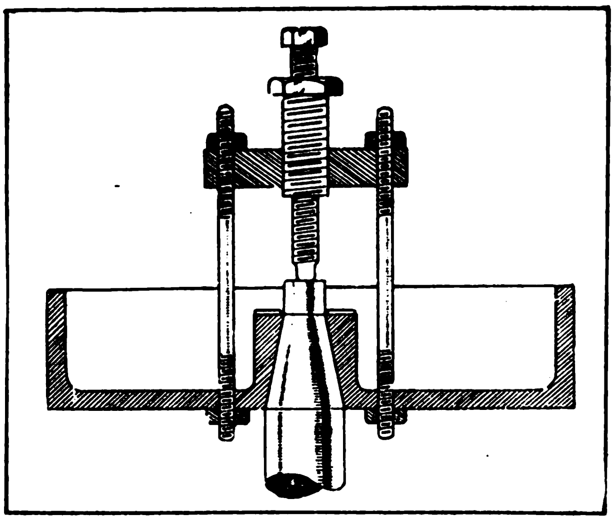


Fig. 3—An Extractor Tool Employing Two Different Pitches of Threads to Exert Leverage.

AN EXTRACTOR TOOL.

An extractor tool, the principle of which is of interest, in that the manner of exerting energy is by a difference in the pitch of the threads of two bolts, is illustrated at Fig. 3, the design being contributed by a mechanic to Motor Traction, a foreign publication. The workman utilized the tool for removing a brake drum which had been driven into position and which resisted the application of ordinary tools.

The tool consists of a plate of mild steel, .75 by two inches, and is tapped out to take a .75-inch bolt about two inches long. The bolt is drilled out and tapped to take a .4375-inch bolt, four inches long. Two holes are drilled in the plate, near its ends, and two pieces of .5-inch mild stud steel, four nuts and a few washers complete the device.

The sketch shows its application, the .4375-inch centre bolt touching the shaft. This is held with a wrench to prevent turning while the smaller member is actuated by another wrench. The difference in the pitch of the two bolts is held responsible for the force exerted.

A CHUCK BUSHING DEVICE.

A device for adapting a three-jaw chuck to take a number of long bushings when the latter are to be ground on the inside is illustrated at Fig. 4. It is serviceable when the grinder must pass through the bushings, calling for a clearance between the end of the work and the face of the chuck.

Three equi-distant spaces are marked off on the chuck and holes drilled through. Three pins are then turned to the shape shown in the sketch. The ends of the pins are threaded to take retaining nuts, and the pins also are drilled and tapped at the other end to take the screw members holding the work.

When these auxiliary jaws are utilized, the bushing is centred in the usual manner, and the steady screws adjusted to the work. If necessary, and where great accuracy is required, lock nuts may be fitted to the set screws. The device may also be utilized in boring long bushings, and extra screws could be made for different work. Jaw chucks having T slots are applicable to this method, but specially shaped T ends would be necessary for the steadying members.

HOME MADE ELECTRO-MAGNET.

While electro-magnets may be purchased for picking up nuts, cotter pins, etc., which fall in places not reached easily by the hand, one of these devices may be made easily by taking the magnets of an old bell and fitting them to a piece of .375-inch iron rod. The free ends of the wires are connected to a six-volt storage battery or a group of dry cells and when the circuit is closed the magnets will attract and hold small pieces of metal that fall into the crankcase, transmission, etc., frequently saving the work of disassembling the part to remove the piece.

BUSHING SPRING SHACKLES.

With the increasing number of commercial cars the progressive proprietor of the repair shop is formulating plans for handling the business vehicle. The spring shackles and bolts are subject to wear, the latter very often wearing oval holes in the shackle and bracket. When such is the case a repair may be completed by fitting a case hardened bushing, provided there is metal enough round the hole, and the new bolt should also be case hardened.

Before hardening, however, a hole should be drilled through the bolt, and another opening made diametrically to meet it. The longitudinal hole should be tapped to take a grease cup, and a flat filed upon the bolt at the point where the other hole is drilled. This will insure proper lubrication of the parts.

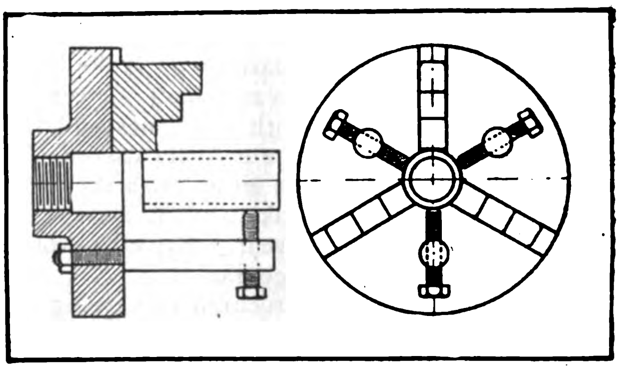


Fig. 4—A Device Applicable to the Chuck When Bushings Are to Be Ground or Bored.

CORRESPONDENCE WITH THE READER.

Cylinder Castings.

(125)—In reading the descriptions of motors in your valuable magazine I notice they state that "the cylinders are of a special gray iron." What is the composition of these cylinders; that is, the materials? CURIOUS.

Richmond, Ind., Jan. 17.

By a special gray iron is meant its characteristics. In the manufacture of cast iron, derived from pig iron, the latter is graded, the most satisfactory method being that of chemical analysis. The following specifications for cylinder castings are those employed by a leading motor car manufacturer:

		Per Cent.
Silicon		1.25 to 1.60
Sulphur	less than	0.11
Phosphorus		0.50 to 0.80
Manganese		0.50 to 0.80
Combined carbon	over	0.40
Graphitic carbon	under	3.00

Kent gives the following formula for automobile cylinders:

	Per Cent.
Total carbon	3.17
Graphitic carbon	2.72
Combined carbon	0.45
Silicon	1.99
Manganese	0.39
Phosphorus	0.65
Sulphur	0.13

Carbon exists in three states in cast iron, namely: Combined carbon, which has the property of making iron white and hard graphitic carbon or graphite, which is not alloyed with the iron, but exists in it as a separate body, since it may be removed from the fractured surface of pig iron by a brush; and a third form, called by Lederbur "tempering graphite carbon," into which combined carbon may be changed by prolonged heating.

Combined carbon increases hardness, brittleness and shrinkage. Up to about 1 per cent. it increases strength, then decreases it. The presence of sulphur tends to increase the combined carbon in a casting, while silicon tends to change combined carbon to graphitic carbon.

Graphitic carbon in a casting causes softness and weakness when above 3 per cent., and softness and strength when added to irons low in graphitic carbon and over 1 per cent. in combined carbons. It increases with the size of the casting, with slow cooling, or rather with holding in the mold a long time at a high temperature.

Silicon acts as a softener, by counteracting the hardening effect of sulphur, by changing combined carbon into graphitic carbon; changes white iron into gray; increases fluidity and lessens shrinkage. The softening effect of silicon is modified by sulphur and manganese.

Sulphur causes the carbon to take the form of combined carbon, increases hardness, brittleness and shrinkage, and also has a weakening effect of its own. Manganese in a small amount, less than .05 per cent., counteracts the hardening influence of sulphur. In larger quantities it changes graphitic carbon into combined carbon, and acts as a hardener. Above 2 per cent. it makes iron very hard. Manganese combines with iron in almost all proportions.

Phosphorus increases fluidity, and is therefore valuable for thin and ornamental castings in which strength is not needed. It increases softness and decreases shrinkage.

Piston Ring Construction.

(126)—I note in your publication that reference is made to the piston rings as being cut concentric and eccentric and that emphasis is laid upon the method of finishing and fitting. What is the difference between the two types and what are the advantages of either, if any?

D. R. W.

Los Angeles, Cal., Dec. 26.

In the early days of motoring the maker did not give the same attention to the manufacture and fitting of piston rings as at present and during recent years these members have been perfected. They are without doubt one of the most important components of the motor, as poorly fitting rings result in the cylinder walls wearing oval, lost compression and heating of the engine, to say nothing of ignition troubles due to the lubricant leaking past the rings and fouling the spark plugs.

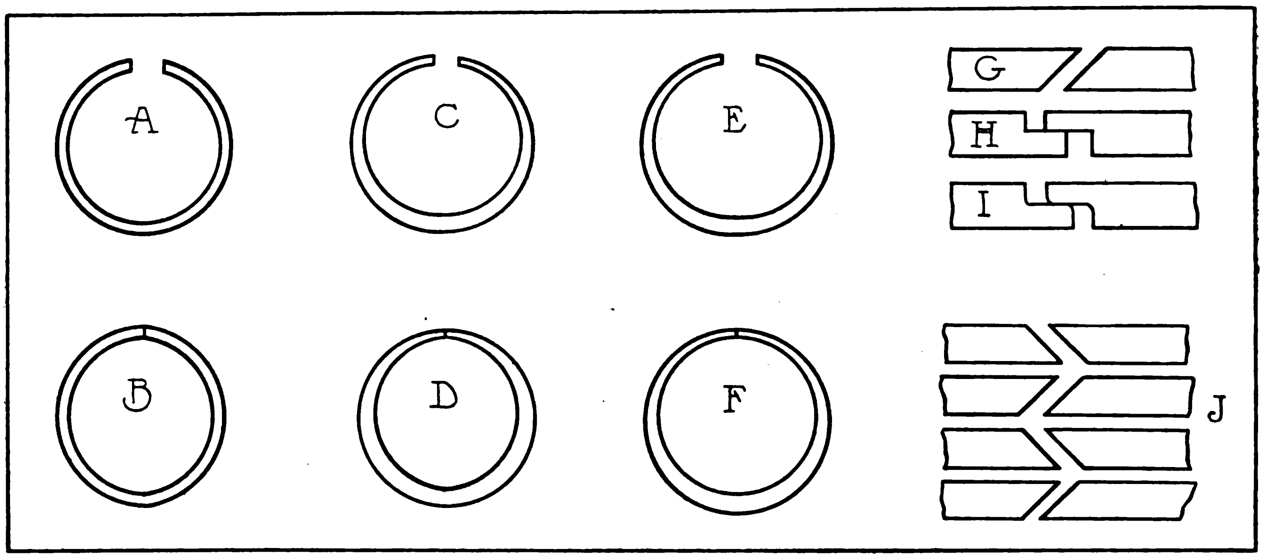
It is a generally accepted idea that if a ring be turned concentric inside and out and then split, the outward pressure on the cylinder walls, when the ring is closed and in its place, will not radiate from the centre. This is demonstrated in the accompanying illustration at A and B, showing the ring open and closed, respectively. It will be noted that with this design there are three bearing points, on either side of the split and at the lowest extremity of the circle.

Such a type would not be practical for service in a cylinder, so the ring is made thicker in the first instance and then turned to a true circle after being closed at the gap, thus giving a full bearing surface all around its circumference. Before doing, this, however, some manufacturers make it a practise to turn out the inner periphery of the ring eccentric to the outer, in order to equalize the pressures at all points of the ring. This is depicted at C and D.

A ring of the eccentric type is shown at E and F and costs but slightly more to manufacture than the type previously described. It is turned to a perfectly true circle inside and out with the gap closed, the outer circle being eccentric to the inner. By referring to F it will be noted that not only are the pressures even on all parts of the ring, but less pressure is required to make it gas tight. It is held that there is less uneven wear of the cylinder walls, less heat developed and greater efficiency of the motor.

Relative to joining the rings there are various methods, some of which are illustrated at G, H and I. That at G consists of a diagonal cut across the face. There is a tendency of this type to rotate in the direction opposite to that in which the lower diagonals point, and some make it a practise to cut every other ring in the opposite direction to its neighbor, as is shown at J.

Another method is to step the rings as indicated at H, while that at I depicts the plan of leaving a radius of metal at the root of the step. An important factor in rings is the accuracy of the fit in the groove. Manufacturers today pay especial attention to the construction and fitting rings, accounting for efficiency of modern motors.



Outlining Piston Ring Construction: A, Concentric Type, Open; B, Closed; C, Eccentric, Open; D, Same Closed; E and F, Eccentric Ring Finished to True Circles Inside and Out; G, H and I, Showing Different Steps; J, Diagonally Cut Rings Arranged Oppositely.

Melting Point of Aluminum.

(127)—Will you please advise me if there is any way of melting aluminum at home? I have tried it on the gas stove with an iron pot. The latter turned red hot, but the aluminum did not melt. PERRY.
Fall River, Mass., Dec. 26.

The melting point of aluminum is 1215 degrees Fahrenheit and this temperature cannot be obtained with an ordinary gas stove. If a casting is desired it should be made in either a dry or "green" sand mold, or in metal "chills." The metal should be melted in plumbago crucibles and not heated beyond its molten point, 1215 degrees Fahrenheit. It also must be poured with care, owing to the absorption of occluded gases and air. Melting aluminum as suggested would involve a furnace capable of developing the proper heat and it is advisable to have the work done at a foundry having equipment for handling the metal. The work would be more satisfactory and less expensive than if it were performed at home.

Fitting Pistons to Cylinders.

(128)—I have a two-cylinder, two-cycle motor and am overhauling it and replacing worn parts. I should like to make a new piston and would like to have your opinion as to how much clearance to allow between the piston and the walls of the cylinder. Also please inform me how strong a motor I would require for a three-ton truck? I want to buy an old automobile with the intention of rebuilding it.

JOSEPH FRANZ.

Brooklyn, N. Y., Dec. 28.

The usual clearance is about .001 inch, although there is a difference of opinion. Much depends upon the cooling efficiency, and as to whether the engine is air or water-cooled. Less than .001 inch has been used with success, but more is common practise. Before fitting a new piston it would be advisable to examine the cylinder to ascertain whether or not it is true. If not it should be rebored as fitting a new piston to a cylinder worn out of true will not warrant the expense involved.

Relative to the proper size motor to employ with a three-ton truck there are a number of conditions to be considered. The list of the three-ton models shows that 40 and 45 horsepowers predominate, although this is not the average, being merely a hasty summary of vehicles listed last season. There are a number of machines equipped with motors rated at from 30 to 40, and it should be borne in mind that the ratings are those given by the manufacturer in the majority of cases, not the S. A. E.

The motor size may be determined from different working conditions, assuming any of the prospective load and tractive resistances as basic in the figuring. The motor should be small enough to render reliable service when the run of the empty vehicle covers good level roads and the desired speed is obtained with the highest ratio in the drive, whereby the engine itself remains within the prescribed economical limits of speed and throttle opening. On the other hand, the motor must be sufficiently strong to propel the loaded machine under average road conditions as expected in service and to maintain the speed found to be most advantageous.

Any increase above a certain limit of tractive resistance, due to changes in the load, the road, etc., will be taken care of by introducing a greater ratio in the drive, retaining the economical motor speed and torque. The greatest ratio ought to be sufficient to make the vehicle negotiate the worst kind of roads to be met in service upon grades at a given slow speed and with a considerable load.

To illustrate the suggested method of selecting the motor for a commercial car, an example is given of a machine of three tons carrying capacity and weighing empty three tons. The tractive resistance when this truck passes empty over a level asphalt road can be assumed at 20 pounds a ton of weight propelled or 60 pounds total. With the driving wheels 36 inches in diameter the combined driving torque is 60x18=1080 lb.-in. For a given type of vehicle the mechanical efficiency in the drive between the motor and the wheels is held to be about 65 per cent. The highest speed ratio in this drive would be found by comparing the desired vehicle speed at this moment with the motor revolutions a minute corresponding to the upper limit set by its fuel consumption requirements with the throttle partially closed.

When the runs are only occasional and for a short time, higher motor revolutions a minute may be selected, followed with increased or reduced ratio in the drive. The latter is held by some to be desirable in that it brings the gear ratio closer to the ratio used for average running conditions, thus reducing the number of gear changes required.

The determined developed torque capacity of the prospective motor should be checked as to the power and speed requirements for average service conditions comprising the most frequent runs with usual loads. When service conditions require great promptness, a more powerful motor may be utilized. As previously stated the nature of the hauls, road conditions, etc., are factors to be considered.

Relative to rebuilding an old automobile into a three-ton truck, it is a question as whether the time and expense involved would warrant the work. Many components would have to be altered and possibly the work would involve the making of special parts which would not only be expensive, but would cause delay in replacement in the event of accident. The writer is of the opinion that it would be far more economical to purchase a machine constructed especially for the work intended. It should also be borne in mind that efficiency and durability are important factors in motor transportation and that the value of a truck depends largely upon reliability in that it is a saver of time.

Wattage of Lamps.

(129)—Will you kindly explain how to find the number of watts consumed in an electrical circuit, such as lamps? ELECTRIC.
Cleveland, O., Jan. 3.

To find the watts consumed in a given electrical circuit, such as a lamp, multiply the volts by the amperes.

Mufflers and Power Loss.

(130)—I noticed in your book that with the use of a cut-out on the muffler, either open or closed, the power of the engine was not affected. Another publication states that there is a loss of power with a muffler closed. Which is right? INFORMATION.
New Haven, Conn., Jan. 16.

The article referred to dealt with a particular test the result of which showed that with a properly designed muffler and with no cut-out open, the loss of energy was very small, so much so that it would appear that no material benefit were derived with the utilization of the cut-out. On the other hand tests conducted by another laboratory developed a loss varying from 1.3 horsepower to 2.5 with 600 to 1300 revolutions.

There is no doubt that there is a slight loss which will be augmented with a poorly designed muffler or one that is choked with carbon, etc. There is a growing tendency to discourage the use of cut-outs and in many cities ordinances are in vogue prohibiting their utilization. There is no reason why the motor should not deliver its maximum efficiency with a muffler, provided the latter is well designed and free from obstructions.

From the Passenger's Viewpoint.

(131)—I frequently see in your publication, remarks especially for chauffeurs, and concluded that through this same channel I could reach the attention of men who are driving just for the weekly stipend without any thought for the comfort of the passengers. They seem to think it a great feat that they have always torn around corners and thus far skillfully (?) avoided an accident. They do not seem to appreciate that it is to their discredit that when a passenger requests them to go slower, they set up the argument that they are not going fast, instead of immediately lowering their speed and saying nothing. While the speed probably is not fast to them, the passenger may be unusually nervous and consequently feels the momentum more than the driver. These chauffeurs are men of excellent habits and fine mechanics, but have not learned the value of self-effacement. AN OLD SUBSCRIBER.
Boston, Jan. 11.

RESTRICTING SLIDING UNIONS.

In the reassembly of the chassis the replacing of the fuel, oil, air and other piping is sometimes annoying because the loose part of the union will slip from the fingers and slide along the pipe to some place difficult of access. A simple kink for preventing this is to solder a ring around the pipe, thus forming a projection against which the union member will strike and stop. Care should be exercised that the ring is so placed that it will not prevent the fitting of the two parts.

TOOL BOARD NEAR LATHE.

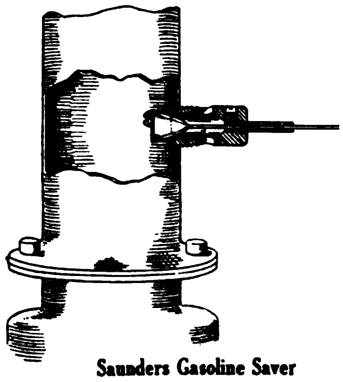
In performing work with the lathe some workmen lose time because the tools required in conjunction with its operation are not handy. In large machine shops boards are employed for keeping the different tools. One of these members is constructed easily of wood, and hangers or studs for supporting the tools may be made from metal pegs. If desired the board may be provided with a list of the tools pasted thereon, making each man responsible for the return of the tools issued him.

Motorists who use the Bergen turnpike in New York State will be able to do so at less cost now, as the public service corporation which controls the road, has reduced the toll fees. There are four gates on the road and the price was formerly five cents at each gate. Hereafter for cars carrying no more than two persons the charge is to be one cent at each gate, and for those with more than two persons two cents.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Saunders Gasoline Saver, manufactured by the Leslie R. Saunders Company, Los Angeles, Cal., as the name implies, is designed to make for economy of fuel. The principle involved is that of diluting a rich mixture by introducing auxiliary air into the intake manifold above the carburetor. The pipe is tapped and threaded to take the air regulator valve which is provided with air passages, but these are controlled by a taper plunger actuated by a flexible cable. The latter is led to the steering column where a control switch member is installed, permitting the driver to change the position of the taper plunger, thereby increasing or decreasing the amount of atmosphere admitted. This arrangement, the maker holds, economizes fuel and increases the efficiency of the motor.


Saunders Gasoline Saver

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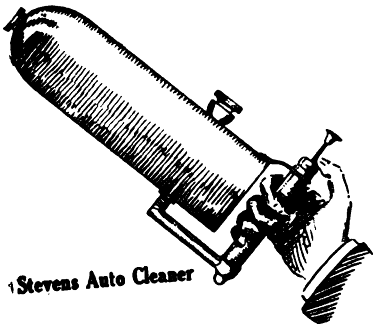
The Stevens Auto Cleaner is the product of the Stevens Manufacturing & Supply Company, 1223 Wabash avenue, Chicago. It is a compact device operated on the compressed air principle and is designed to produce a fine spray or a dynamic stream of gasoline, kerosene or other cleansing fluid. The handle forms the plunger pump, a few strokes of which develops sufficient pressure for the entire contents of the vessel. Although constructed for removing grease and dirt from the automobile, it may be employed for cleansing clothing.


Stevens Auto Cleaner

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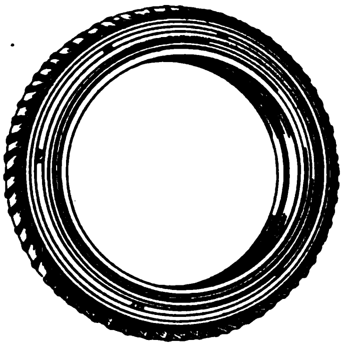
Ferromatic Tires are the product of the Ferromatic Tire & Manufacturing Company, Cleveland, O. They are designed to fit any standard type of wheel utilizing quick detachable or clincher rims, also some designs of demountable rims. A solid rubber tread is fitted over a metal shell and diagonally placed steel springs replace the usual compressed air of the inner tube. The device is secured to the felloe of the automobile wheel by a channel member. The sides of the outer shell lap over those of the channel section and water and dirt are eliminated by leather packing rings. The springs are placed tangently to the felloe of the wheel and are so constructed that they never act in tension.


Ferromatic Tire

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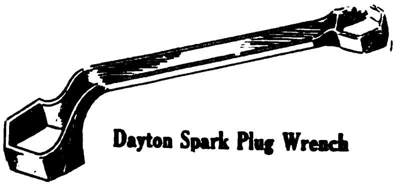
The Dayton Spark Plug Wrench, manufactured by the Dayton Malleable Iron Company, Dayton, O., is designed for service where the ordinary straight handled tool cannot be employed successfully, the shape of the tool being such that it is possible to reach and loosen spark plugs and nuts located in recessed sections. A quality of the wrench is that it will fit either .875 or 1.125-inch plugs and its long handle makes it possible to exert considerable leverage. The tool is made either in nickel or Japan finish.


Dayton Spark Plug Wrench

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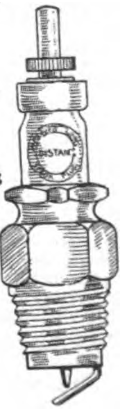
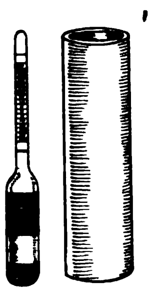
The Long Distance Spark Plug, marketed by the Long Distance Spark Plug Company, 212 South Illinois street, Indianapolis, Ind., is designed to withstand severe service and among its qualities is the construction of the porcelain and terminal. The former is provided with a rounded shoulder around which is fitted an expanding metal thimble which is compressed by a bushing, making for a gas tight joint, as well as preventing opportunity of blow-outs. The terminal screws onto the electrode, permitted the use of connections of the closed end type, and the exterior of the plug terminal is recessed, allowing the fitting of the clip connectors. The plug is put upon the market with a very liberal guarantee.


Long Distance Spark Plug

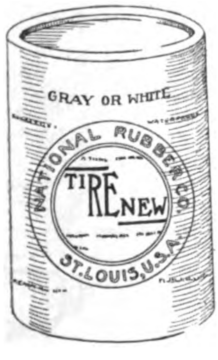
The Kno-Freeze-Meter is marketed by C. J. Tagliabue Instrument Manufacturing Company, 396 Broadway, New York City, and is designed especially for testing anti-freezing solutions in which alcohol is employed. The meter is provided with a graduated scale, indicating the different temperatures of the solution, and to use the device a little fluid is drawn from the radiator in a special glass jar. The meter is then floated and the scale indicates the temperature at which the mixture will freeze. A box is provided for carrying the meter and jar.



Kno-Freeze-Meter

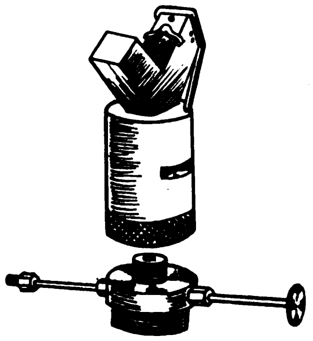
* * *

Tirenew is manufactured by the National Rubber Company, Inc., 4414 Papin street, St. Louis, Mo., and is a coating for automobile, motorcycle and bicycle tires. The maker states that the base of the composition is pure Para rubber and that being in liquid form it is applied easily to the exterior of the shoe after the latter has been cleaned. It also is pointed out that not only does the preparation preserve the rubber, but the appearance of the tire is improved by its use.


GRAY OR WHITE
NATIONAL RUBBER CO.
TIRENEW
ST. LOUIS, U.S.A.

Tirenew

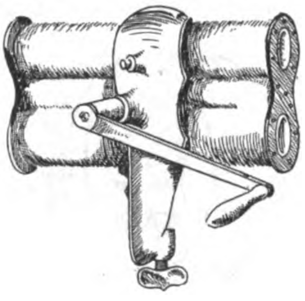
The Advance Adapter and dashboard regulator is a new product of the Advance Motor Specialties Company, 508 South Dearborn street, Chicago. The complete outfit comprises a dashboard regulator of acetylene and adapters for the kerosene lamps. The latter screw into the oil members in place of wicks, which are carried in the tool box for emergency. The company points out that this arrangement provides for kerosene, gas and electric lights in the side and tail lamps. All lamps fitted with the acetylene adapter are lighted by a spark, and gas is conducted to the burners by small tubing with solderless joint connections. Each adapter is fitted with a needle valve for regulating the flame or shutting off the supply of gas which is lighted by pushing a button. The regulator handle of the dashboard equipment is removable, locking the device, and the sparking tips of the burners are so designed that they cannot be injured very easily.



Advance Adapter

* * *

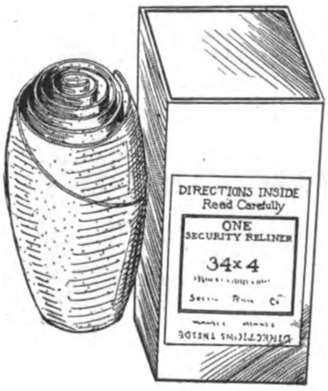
The Hawthorne Tire Pump, made by the Hawthorne Manufacturing Company, 29 Spruce street, Bridgeport, Conn., is a compact, four-cylinder unit which may be carried easily in the tool box or any other convenient place in the car. It may be attached to the running board in a few seconds by a clamp device, and the largest sized tire can be pumped up quickly. The pump is provided with four cylinders which produce a constant flow of air to the inner tube when the handle is rotated. The design of the pump is such that little exertion is required to operate it, and being constructed of high grade material it is very durable. Each equipment is provided with ample hose, enabling the inflating of all four tires without changing the position of the pump.



Hawthorne Pump

* * *

The Security Reliner, as the name implies, is a lining for casings which the maker, the Security Reliner Company, Inc., Montgomery, N. Y., states is two tires for one. It is constructed to conform to the shape of a casing and covers the entire inside, including the bead, preventing blow-outs when the shoe is rim-cut. That portion of the reliner that comes in contact with the tire is covered with a self-vulcanizing compound made by the company, and the device is attached by moistening the surface with a little gasoline. The Security reliner comes wrapped in air-tight wax paper, packed in a neat carton and may be carried easily in the car.

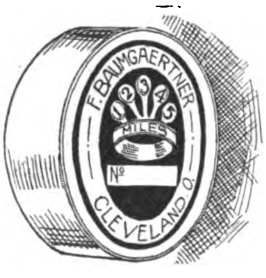


Security Reliner

* * *

The Coronet Recorder, manufactured by F. Baumgaertner, 2344 East 105th street, Cleveland, O., is a recording device constructed in the form of a hub cap, which member it replaces upon the automobile.

The device is self-contained, is not attached to the axle and operates on the gravity principle. The maker states that it will register the mileage covered both forward and backward up to 100,000 miles, or up to 10,000 miles, showing 10ths. It is dust and weather proof and is designed so as not to be tampered with by the operator. Its accuracy is guaranteed for two years.



Coronet Recorder

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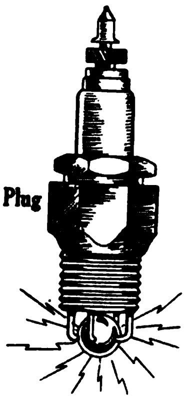
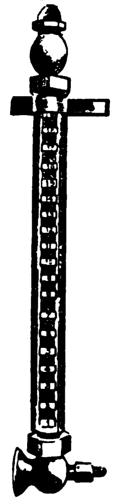
The Flash Ball Spark Plug, manufactured by the Toledo Auto Devices Company, Gardner building, Toledo, O., is novel in its design in that the central electrode terminates in a sphere or ball. The maker points out that this member acts as an accumulator of current and that the spark developed between it and the four contact points of the shell is of greater intensity than other forms of plugs. It is also stated that the ball deflects the sparks into the mixture, increasing the efficiency of the motor because a larger amount of the vapor is converted into useful energy. The plug is made in .5-inch standard, A. L. A. M. and metric threads and is moderately priced.



Flash Ball Spark Plug

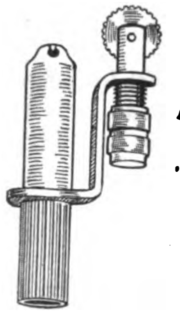
The Imperial Fuel Gauge, manufactured by the Imperial Fluid Gauge Company, Dayton, O., possesses among other qualities that of indicating the amount of gasoline in the tank, the registering device being so constructed that it may be attached on the dash in plain view of the operator or at any other convenient place. A substantial glass tube, graduated to correspond to the capacity of the fuel tank, is mounted in a metal frame. The fluid is led to the bottom of the tube through a valve, which may be closed if desired, and a float in the tube rises with the gasoline, indicating the quantity on hand. The gauge is adaptable for either gravity or compression feed systems and throughout solderless connections are utilized. Among the advantages claimed for the device are: It indicates the amount of fuel in the tank, quantity consumed by the motor, detects loss of gasoline by leaks or flooding of the carburetor and indicates the amount received when purchasing. The gauge and equipment is inexpensive.



Imperial Fluid Gauge

—— ★ ——

The Auto Gas Lighter is produced by the Auto Gas Lighting Company, Fountain City, Ind., and is used for lighting lamps employing acetylene. It comprises the burner and lighting device as a unit and replaces the ordinary member. An arm or extension of the burner carries a small wheel, which when rotated by the thumb or finger, gives off a shower of sparks in the path of the escaping gas. The igniting member is adjustable, does not interfere with the reflected light, and may be renewed from time to time. There is but one gas outlet in the burner proper. It is made both for automobile and motorcycle lamps.



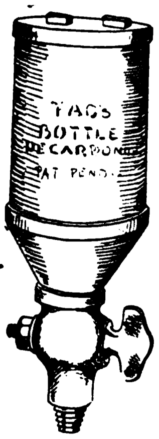
Auto Gas Lighter

—— ★ ——

Bottle Decarbonizer is the product of the Toledo Auto Devices Company, Cleveland, O., and the container holds about four ounces of a special liquid decarbonizer which is utilized when the motor is running warm. The bottle is provided with a gas tight valve, at the end of which is an adapter for screwing into the spark plug opening. The decarbonizing material is inexpensive and the maker claims that by using it regularly about every 500 miles the disassembling of the motor will not be necessary. The device is of brass, highly polished and compact.

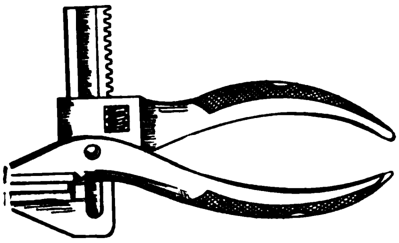
—— ★ ——

Starrett's Expansion Pliers, manufactured by the L. S. Starrett Company, Athol, Mass., will appeal to motorists who desire a tool that will perform the function of a monkey wrench and pliers when either of these tools is not practical for the work to be



Bottle Decarbonizer

performed. The Starrett device may be employed to start and loosen rusted nuts or bolts, and the jaws may be expanded to fit large sized parts. The pliers are constructed of the same high grade material for which the maker is noted.

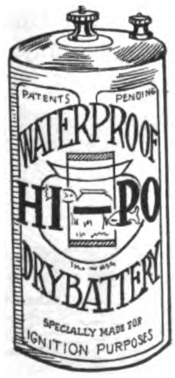

Starrett Expansion Pliers

* * *

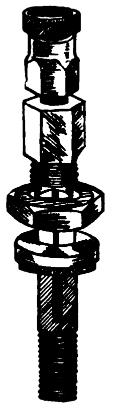
The Hi-Po Dry Cell, manufactured by the Lincoln Electric Company, 1007 Atlantic avenue, Brooklyn, N. Y., is an improvement over ordinary batteries in that it is water proof. This quality is obtained through a patented process of manufacture and one it is said that absolutely protects the cell against all outside influences, such as moisture, heat, etc. Each unit is sealed in an insulated case and the maker points out that it may be left standing in water without danger of short circuiting. Because of its construction greater efficiency and longer life is assured.

* * *

Ford Injector Bolts, produced by the Home Light Manufacturing Company, 2108 Dayton street, Chicago, are specially drilled bolts for the Model T Ford motor. They replace the four bolts which retain the cylinder head and permit the utilization of priming cups without alteration of the water jacket. They also may be employed for equipping the motor with an acetylene starting system. To install the bolts it is only necessary to drill four .375-inch holes through the inner wall of the cylinder head. The bolts are so marked that the installation is an easy matter. Lock nuts having concave washers and asbestos packings are employed, making the device gas tight. The bolts and priming cups are moderately priced.

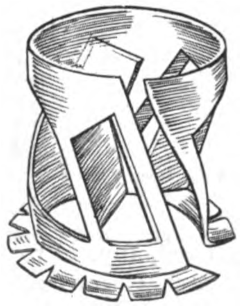


Hi-Po Dry Cell

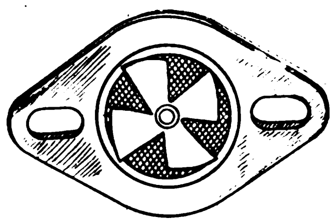

Ford Injector Bolts

* * *

The Egyptian Mixer, is manufactured by the R. D. Loose Mixing Chamber Company, 110 North Fifth street, Springfield, Ill., and is a patented device for completing the vaporization of fuel after leaving the carburetor. It is inserted in the intake pipe between the vaporizer and the cylinders and any particles of gasoline not aerated are broken up and converted into useful vapor by the mixer. The maker claims that greater mileage is obtained upon a gallon of fuel and that the design is such that it may be attached easily to any type of induction pipe, etc.

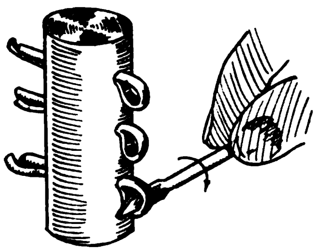

Egyptian Mixer

The Automizer is the product of the Automizer Manufacturing Company, Canton, O., and is designed for insertion in the intake pipe or manifold between the carburetor and the cylinders. The object of the device is to break up and convert into useful vapor any particles of fuel which have not been aerated by the vaporizer. The Automizer has no moving parts, being constructed of thin sheet metal having an aperture of the same diameter as the intake pipe which is fitted with a wire gauze. Four stationary blades are secured to the screen member and the mixture striking these projections is converted into a fine mist.

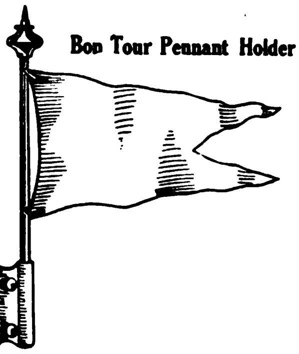

THE AUTOMIZER

* * *

The Campbell Cotter Pin, which is being manufactured by the inventor, A. C. Campbell, Waterbury, Conn., possesses features which will appeal to the motorist and repairman as it is easily fitted and removed and may be used over again as many times as desired. It is constructed of half-round wire, but is bent in a different manner than the ordinary pins. The Campbell pin is constructed with two limbs of unequal length and has an offset eye. The tip of the long portion is bent at an angle across that of the short member so that when the pin is inserted and the eye given a blow with a hammer the tips will engage as shown in the il-


Campbell Cotter Pin

lustration, causing them to separate. The pin may be removed easily with a screw driver as twisting the eye section returns the pin to its original shape. The Campbell pins come in a nickel screw top box containing 125 assorted sizes.


Bon Tour Pennant Holder

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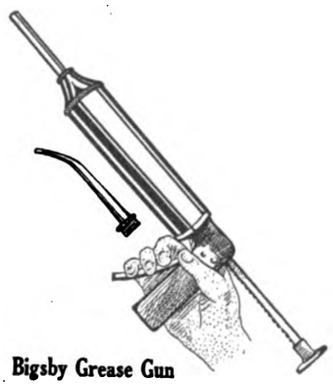
The Bon Tour Pennant Holder is produced by the Bon Tour Manufacturing Company, Cobleskill, N. Y., and is designed for attachment to the frame of the windshield. The retaining member is a two-part clamp adjusted by means of locking screws, a design facilitating attachment and removal. It is provided with an 18-inch rod having two rings, to which is secured the pennant, etc. The holders come in pairs and are finished in brass, nickel or oxidized.

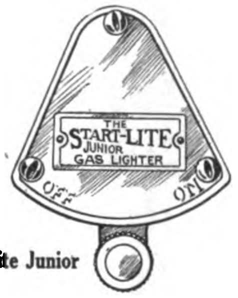
—— ★ ——

The Bigsby Grease Gun, marketed by the Bigsby Manufacturing Company, Cleveland, O., differs from the usual member in that its operation is automatic and only one hand is essential in its employment. The plunger or rod is provided with teeth which register with similar members of the actuating mechanism enclosed in a handle having a lever. Compressing this lever operates the rod, which forces the grease to the parts to be lubricated. The design of the gun is such that gasoline, oil or grease may be used. The usual washer is replaced by a metal piston ring. When desired the gun may be employed as a syringe by giving a half-turn to the rod.


Bigsby Grease Gun

—— ★ ——

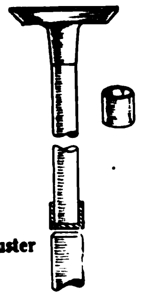
The Start-Lite Junior is a new lighting device brought out by the Start-Lite Company, 1502 Michigan avenue, Chicago, maker of the Start-Lite lighter. The new device operates on the same principle as the original lighter, controlling the flow of acetylene from the tank to the headlights, and enables the lighting of these members without the driver leaving the seat. It operates on the same principle as a switch and is easily installed.



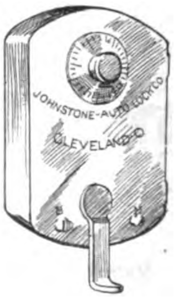
Start-Lite Junior

—— ★ ——

The Apco Valve Stem Adjuster is marketed by the Auto Parts Company, Providence, R. I., and is constructed for model T Ford cars. It comprises a thimble like cap of hardened Jessops steel and a number of very thin hardened discs. It is designed for attachment to the valve stems when these members have become worn and do not provide the proper lift to the valves. They are made in three sizes, that for the Ford motor being .4375 inch.


Apco Valve Stem Adjuster

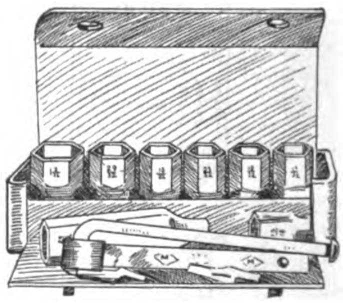
The Johnstone Auto Lock, manufactured by the Johnstone Auto Lock Company, 874 Rockefeller building, Cleveland, O., is a device for locking the ignition system, preventing thereby the operation of the car or its loss by theft. It comprises a pressed steel box which is secured over the coil on the dash, by screws inside. It is fitted with a combination lock to open which a dial is rotated to certain numbers. The combination may be changed from time to time as desired. The lock is neat and compact and can be attached in a few minutes.



Johnstone Auto Lock

—— ★ ——

The Mossberg Wrench outfit, manufactured by the Frank Mossberg Company, Attleboro, Mass., is a valuable addition to the tool equipment of the cars as well as the garage. It comprises a number of socket members, varying in sizes adapted to the components of the motor car, and a folding operating member adapted to fit the sockets. An extra long socket member is provided, also screw driver attachments. The construction of the socket holders is such that considerable leverage may be exerted upon frozen or rusted nuts. The material and workmanship are of the best and the tools come in a neat, folding case. It is moderate in price.


Mossberg Box Wrenches.

Recent Patents of Interest

Hubert Portable Electric Light.

Conrad Hubert, New York City, has been granted a patent for a portable electric light comprising a casing into which is placed the battery, and means for making proper connection to the positive and negative poles. The casing is provided with an aperture for securing the electric bulb, contact with the lamp being made by a finger member. The other casing terminal is exposed. The circuit is closed through this terminal, a movable finger device being fitted to the exterior of the casing. Means are also provided for locking the switch mechanism.

Bassett Radiator Shield.

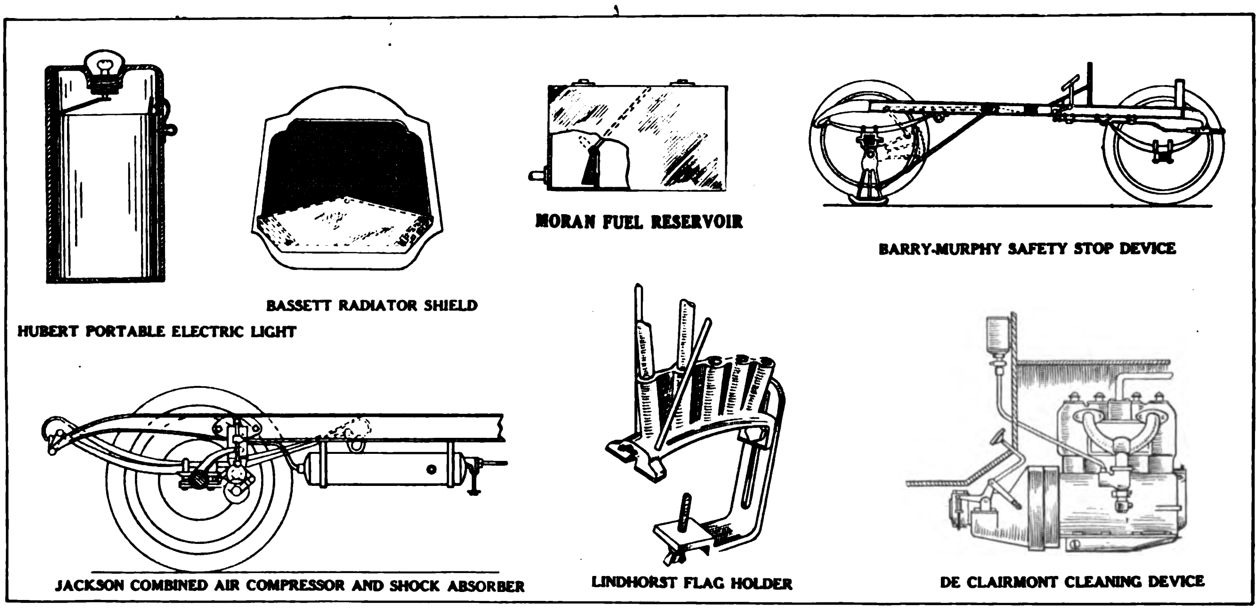
The patent granted Frank F. Bassett for a radiator shield is a reminder of the approach of cold weather when the radiator will require protection from the freezing winds. The Bassett device does not differ from those of the usual form, but means are provided for securing the shield through the openings of the cooler and without injury to the metal. Bolts and flexible washers are utilized to retain the shield and the bolts are covered with a sleeve of soft material to prevent chafing due to vibration. The device is constructed so that it may be detached and replaced easily, catches being provided for this purpose.

Moran Fuel Reservoir.

One of the troubles experienced with fuel tanks supplying gasoline to the carburetor by gravity is that when the car is ascending a steep grade and the vaporizer is higher than the level of the fluid in the vessel, the motor is starved of mixture. William H. Moran, New York City, has patented a fuel reservoir which device is claimed to overcome the trouble. The design is such that it is stated in his claims that when the tank is tilted the fuel will be discharged through the proper channels to the carburetor. The vessel is constructed in two parts, a main and an auxiliary chamber. A pivotally weighted valve is incorporated, its function being to allow the flow of fluid from the main into the auxiliary chamber, but to obstruct its return. This operation is performed automatically when the tank is tilted or when the discharge head of liquid in the large chamber is greater than that of the other compartment.

Barry-Murphy Safety Stop Device.

Richard P. Barry and John W. Murphy, Brooklyn, N. Y., have patented a safety stop device for motor cars which presents novel features in that the vehicle is checked by means of a pair of shoes. These members are pivotally connected to the rear axle of the machine so that they may be dropped to the ground when desired. They are connected to operating mechanism and actuated by a pair of arms having a ratchet wheel



HUBERT PORTABLE ELECTRIC LIGHT

BASSETT RADIATOR SHIELD

MORAN FUEL RESERVOIR

BARRY-MURPHY SAFETY STOP DEVICE

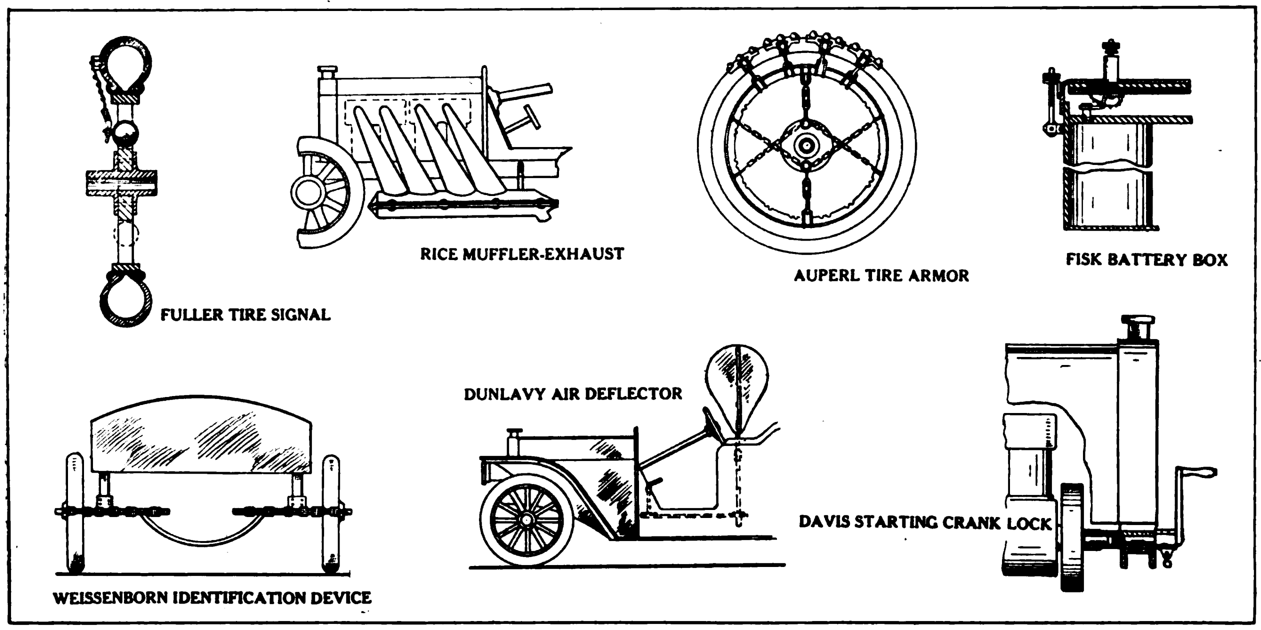
JACKSON COMBINED AIR COMPRESSOR AND SHOCK ABSORBER

LINDHORST FLAG HOLDER

DE CLAIRMONT CLEANING DEVICE

Presenting Some of the Recent Efforts of Inventors, Including a Radiator Shield, Portable Electric Light, Safety Stop Device, Multiple Pennant Holder and Combined Air Compressor and Shock Absorber.

rigid with said arms. A pawl co-operating with the ratchet member maintains the arms and shoes in a raised position when the service of the latter is not desired. Upon releasing the pawl mechanism, the shoes drop to the ground, restraining the movement of the vehicle.



Illustrating Some of the Recent Patents Applicable to the Motor Car.

Jackson Air Compressor and Shock Absorber.

Joseph D. Jackson, Jr., Washington, D. C., has been granted a patent for a combined air compressor and shock absorber applicable to motor vehicles. It is designed to store a quantity of fresh air for the purpose of inflating pneumatic tires, operating a motor starter or other device employing compressed air. The atmosphere thus stored is also utilized as a shock absorber. The air is pumped by the action of the vehicle springs. A cylinder is attached to the body of the machine and the piston of the compressor is so designed that it completes its stroke before it reverses, compressing the air which is conducted by suitable means to a storage tank. Check valves are provided, also a flexible tubing to compensate for the movement of the cylinder. Motion is imparted to the piston by the movement of the frame when the car is traversing rough roads. The construction and operation of the shock absorbing device is as follows: A crank disc is mounted on a shaft, a component of the bracket securing the device to the frame, and the shaft is journaled in bearings in the depending portion of the bracket. In the opposite end of the shaft is a pinion which meshes with a gear wheel on the shaft. This gear wheel carries a ratchet member. Two arms are mounted upon the shaft and carry pawls which engage with the teeth of the ratchet member, are actuated by springs and are always held in engagement with the ratchet. The pawls are reversed so that when one is turning the ratchet and gear wheel in one direction, the other is slipping over the teeth of the ratchet. Lever arms are connected to the other arms, the former members being pivotally secured. One of the lever arms is connected to a bolt in the bracket arm which is secured to the axle by clamping bolts. Through the bifurcated end of the bracket extend screws which are concaved at their inner ends to partly embrace the bolt. This construction, the inventor claims, permits the lever arms to swing on the bolt member as well as on the screws, giving a universal movement. When the axle and chassis frame move up or down the piston completes its stroke before it reverses, or in other words, the crank disc will always rotate in the same direction. This is due to the movement of the arms which rotate the gear wheel in the same direction, whether said arms move up or down, as the pawl on one will be moved over the teeth of the ratchet while the teeth of the other pawl rotate the gear wheel. By this construction the piston is always cushioned.

De Clairmont Motor Cleaning Device.

Adolfo De Clairmont, Toledo, O., has been granted a patent for a device for cleansing the cylinders of an explosive type motor while it is operating under its own power. Mounted on the dash of the automobile or other convenient place, of the carburetor and a valve is incorporated in the reservoir to control the flow of the liquid. The nature of the cleansing material to be employed is not given by the inventor, but it is presumed that any liquid decarbonizing preparation may be utilized.

Lindhorst Pennant Holder.

The growing tendency to mount flags and pennants upon the automobile has been productive of a number of ingenious devices for securing these members. Edward H. B. Lindhorst, Butte, Mont., has patented a flag holder that differs from those of ordinary construction in that five flags may be carried in one device if desired. The support comprises an arched base having a depending foot at either end, said base being formed integral with the socket members. The clamp consists of a vertical arm and bottom plate, and one of the feet of the base carries a bolt having a clamping nut, the bolt extending through the slot of the vertical arm of the clamp, providing means for adjusting the device to different conditions of service. The bottom part of the clamp has a depression adjacent to the vertical arm, having its outer free end offset and carrying a clamp screw.

Fuller Tire Signal.

A patent has been granted to Fred Leo Fuller, Sacramento, Cal., for a signalling device for pneumatic tires, and the invention presents novel features in that it appears to be attached easily and is designed to give the operator of the automobile warning when a shoe becomes deflated through a puncture, etc. The device includes a bell, which is clamped to the spokes of the wheel, and a projecting operating lever. Attached to this lever is a chain having a closed coil spring the tension of which is greater than the spring within the bell. The chain member is secured to the tire in such manner that when the latter becomes deflated the tension of the coil spring relaxes, releasing the lever of the bell, causing it to ring.

Rice Muffler and Exhaust Pipe.

Walter T. Rice, Chicago, has patented a combined muffler and exhaust pipe for internal combustion motors and the device is so designed that the usual exhaust manifold is dispensed with, being replaced by flaring funnels, the number of these corresponding to the number of cylinders of the motor. The ends secured to the motor have openings corresponding to the diameter of the exhaust port and the flare is increased to about three times the diameter of the port at the place of attachment to the muffler. The latter is cylindrical in form and is constructed in two sections secured by bolts. The outlet for the exhaust gases is located beneath the muffler. By this arrangement the muffler is positioned near the forward part of the chassis and the usual exhaust pipe is eliminated.

Auperl Tire Armor.

Of late several inventions are noted for providing tires with traction devices and among the more recent is that of Harry Auperl, New York City. The inventor claims that it not only prevents skidding, but it is puncture proof. It comprises rings of less diameter than the wheel, these being placed on either side. The ring on the outer side is composed of separately disconnected parts. Both are provided with detachable cross chains and turnbuckles connect these members. The tread of the tire is covered with armor plates having a number of balls which provide anti-skidding qualities. The plates are retained by chain devices which are secured to the rings.

Fisk Battery Box.

In connecting dry cells in series or multiple series with ordinary wires, the connectors are liable to work loose, causing considerable annoyance when employed for ignition purposes. Henry M. Fisk, Watseka, Ill., has been granted a patent for a battery box which is claimed to eliminate wiring, as all necessary connections are contained within the device. The box or container is of sheet metal and is provided with a cover of similar material which fits over the container. The inner portion of the cover is suitably insulated and is provided with spring contactors which make the necessary connections from the positive of one cell to the negative of the next. These connectors consist of strips of metal so bent at the end as to present the two lateral edges downwardly for the purpose of causing said lateral edges to enter between the threads on the binding screws. Means are also provided for vertically adjusting the cover so as to increase or decrease the pressure of the connectors on the battery terminals.

Weissenborn Identification Device.

Oscar A. Weissenborn, Jersey City, N. J., has been granted a patent for an identification device which presents original features. It comprises a fender secured to the front of the automobile by brackets and a large number of brass discs or identification checks are contained in the fender. A thin brass wire, in two sections, is included in the device and when the wire comes in contact with any solid material it releases the discs. The object of the invention is to provide means of identifying automobiles the operators of which seek to escape after an accident.

Dunlavy Air Deflector.

Harry Craft Dunlavy, Fresno, Cal., has been granted a patent for an air deflector for attachment to motor cars or other vehicles. It comprises a vane member which is mounted at the top of a vertical shaft. A second vertical shaft carries a sprocket at its lower end. A chain connects the sprocket to a similar member located conveniently to the operator's foot, and a lever is fitted for actuating the chain and controlling mechanism. By it the vane may be placed in any desired vertical position for deflecting air currents.

Davis Starting Crank Lock.

The increasing number of cars reported stolen has stimulated the efforts of inventors to design locking devices and among those recorded is the Davis starting crank lock, patented by William J. N. Davis, Chicago. It comprises a two-part sleeve adapted to be removably fitted upon the crankshaft, to extend between the crank of the shaft and the support through which the shaft is mounted, and to serve as an abutment for holding the shaft against longitudinal movement. Means are also incorporated for holding the parts of the sleeve assembled. The sleeve has apertured ears and a lock having a hasp engages through said apertures, providing means for locking.

Many repairmen have a special piece of oil stone which they have used for a number of years. If the member is placed in a cloth after use it will be found that the material will absorb the oil, preventing the lubricant from filling up the pores of the stone and reducing its efficiency because of the gum like surface.

LOCATES IN WASHINGTON.

South Dakota Concern Will Manufacture and Operate Trucks in District of Columbia.

The American Motor Traffic Company, incorporated under the laws of South Dakota, was formally organized at Washington, D. C., Dec. 18, where it will occupy the fourth floor of the new Citizens' Bank building at 1421 G street. The directors of the company are: President, E. S. Alvord, president of the Littlefield & Alvord Express Company; first vice president and acting manager, S. J. MacFarren, manager of the Engineer Searching Company; second vice president, W. J. Moore, president of the Moore Company; secretary, A. L. Kley of New York City; directors, the above and J. C. Muncaster of Washington and J. C. Menocher of Pittsburg.

The company will specialize in heavy duty commercial motor vehicles of the pivoted spindle, multi-wheel drive and steer type, with flexible load suspension and balance, also in liquid fuel combustion engines and vehicle accessories. Many other claims for improvement in vehicle construction are controlled by the company under patents granted to MacFarren, Thomas and others, and further protected by special trade marks. The concern is empowered to operate, as well as manufacture, motor vehicles for all uses and proposes to establish freight, express and passenger services in response to demand, through its exclusive state agencies or auxiliary companies.

RESIGNS FROM REMY COMPANY.

Deupree Becomes Associated with Sourbier in Indianapolis Real Estate Firm.

H. G. Deupree, for the past two years assistant sales and advertising manager of the Remy Electric Company, Anderson, Ind., maker of Remy magnetos, has resigned to become vice president and active executive of the Sourbier-Emrick Reality Company in Indianapolis. The president of this concern is E. G. Sourbier, another well known automobile man.

Mr. Deupree has been associated with a number of motor car and accessory companies since graduating from a newspaper desk. He joined the Remy company at the same time F. E. Moskovics became sales manager. It is understood that he will remain with this concern until the first of the year, and may be retained in an advisory capacity for some weeks.

Mr. Sourbier was one of the organizers of the Marion Motor Car Company, Indianapolis, and was associated with J. N. Willys in the development of the Willys-Overland Company. Later he was connected with the Ideal Motor Car Company, which he helped Henry Campbell and Harry Stutz to organize. He is now regarded as one of the most successful real estate men in the Hoosier state.

TO SUPPLY DETROIT'S LEATHER.

Organization of Company Expected to Affect Local Market in Material Degree.

With the knowledge that Detroit automobile manufacturers use annually $7,500,000 worth of leather, most of which comes from eastern tanneries, Walter S. Gurd of the Hammond building, E. S. Barbour and R. B. Gillespie of the Michigan Stove Company, and Edwin Armitage, an expert tanner, have organized the Armitage Leather Company, with a capital of $35,000 and have opened a plant at 87 West Congress street, Detroit.

The company has already filled its first order and hopes to so increase its business as to warrant the construction of a tannery and the organization of a $250,000 corporation within a year. Mr. Armitage is said to have discovered a secret process of treating leather which it is believed will revolutionize the industry and produce a better material. Mr. Gurd hopes the company can manufacture all the leather Detroit concerns use and at the coming Detroit show, Jan. 27-Feb. 1, some of the company's work will be exhibited in gray, navy blue, black and fancy colors, and suitable for various purposes.

ENTERS ADVERTISING FIELD.

Gleeson Murphy Leaves General Motors Company Under Particularly Favorable Auspices.

Gleeson Murphy, who for the last two years has been assistant to President Neal of General Motors Company, has opened a branch at Detroit for the H. K. McCann Company of New York, one of the strongest and best known advertising agencies in the United States. Mr. Murphy, who is a student of big organizations, leaves the General Motors Company with the asset of having materially assisted in the reorganization of that company and his present purpose is to establish a complete advertising agency in Detroit, backed by the best experts in the merchandising line.

The McCann company is composed of general advertising experts of national reputation, including H. K. McCann, former advertising manager of the Standard Oil Company; Herbert W. Casson, well known writer, orator and efficiency expert; Thomas Nast, president of Nast Art School; Gerald B. Wadsworth, author of "Principles and Practises of Advertising;" R. M. St. Hill, A. E. Foot and H. Atwood.

Mr. Murphy, besides having the advice of these men, will be assisted by a local corps of experienced writers and artists. He begins his new enterprise with a high degree of fitness for his work, his experience in handling large sales problems being a strong asset. The offices of the company will be located in the Boyer building, Detroit.

WARREN SECURES MORE CAPITAL.

Plans Inaugurated to Care for Increased Business During the Coming Year.

At a recent meeting of the stockholders and others interested in the Warren Motor Car Company, Detroit, Mich., maker of Warren cars, steps were taken to increase the working capital of the organization. Plans also were inaugurated looking toward a largely increased business during the 1913 season.

The following board of directors was elected: F. H. Lewis, Jackson and Detroit; S. G. Jenks, Port Huron; H. H. Bassett, Flint; J. V. Mowe, Akron, O.; G. John, New York City; C. R. Wilson, C. Haines Wilson and Homer Warren. The last three are Detroit men and have been connected with the Warren company for some time past.

ADDS THREE BUILDINGS.

Increase in Packard Plant Makes Possible Production Throughout the Entire Year.

Aiming at production all the year round, the Packard Motor Car Company, Detroit, maker of Packard cars, has added three new buildings, providing an additional acre of floor space. The policy of the Packard company is to bring out two models annually, the big six in the spring and the little six in the autumn, although the production of each is to continue through a whole year.

This will bring something new from the plant each half year. This year the Packard 48 made its debut about June and the 38 in November. The latter will appear in every type but the seven-passenger touring car, which is only fitted to the 48. Both models are sixes and the production will be about equal in number.

RESPONSIBLE FOR COLBY SALES.

F. P. Steinhauer Leaves Abbott Motor Company to Becomes General Sales Manager.

F. P. Steinhauer, for the past two years district sales manager of the Abbott-Detroit cars, made by the Abbott Motor Car Company, Detroit, covering the states of Iowa, Nebraska and part of Illinois, has resigned his position to become general sales manager of the Colby Motor Company, Mason City, Ia., maker of Colby cars. The appointment took effect Dec. 2.

Although not yet 30 years of age, Mr. Steinhauer has attained an enviable reputation and is conceded to be one of the most successful automobile salesmen in the Middle West. He is a man of large ideas and works with an enthusiasm that has invariably brought him big results. Prior to joining the sales force of the Buck Auto Company of Davenport, Ia., a number of years ago, Mr. Steinhauer was a public school teacher. Several other companies also engaged his services before he joined the Abbott Motor Company, and his experience in the retail selling field has been of particular value in this connection.

JOINS REO TRUCK FORCE.

R. E. Paris, Formerly of Olds Motor Works, to Aid in Marketing New Model.

Rupert E. Paris has joined the executive staff of the Reo Motor Truck Company, Lansing, Mich., maker of Reo trucks, as the result of negotiations which have been carried on quietly for some time. Until recently Mr. Paris was sales manager and assistant treasurer of the Olds Motor Works, having gone to Lansing when the Oldsmobile was taken over by the General Motors Company.

His addition to the Reo company is for the purpose of strengthening the managerial staff of the organization to keep pace with the wonderful growth of the business, which was founded only two years ago. The concern has added to its line a truck of two tons capacity and the new vehicle, which has been particularly well received, will be exhibited at the principal motor car shows the coming season.

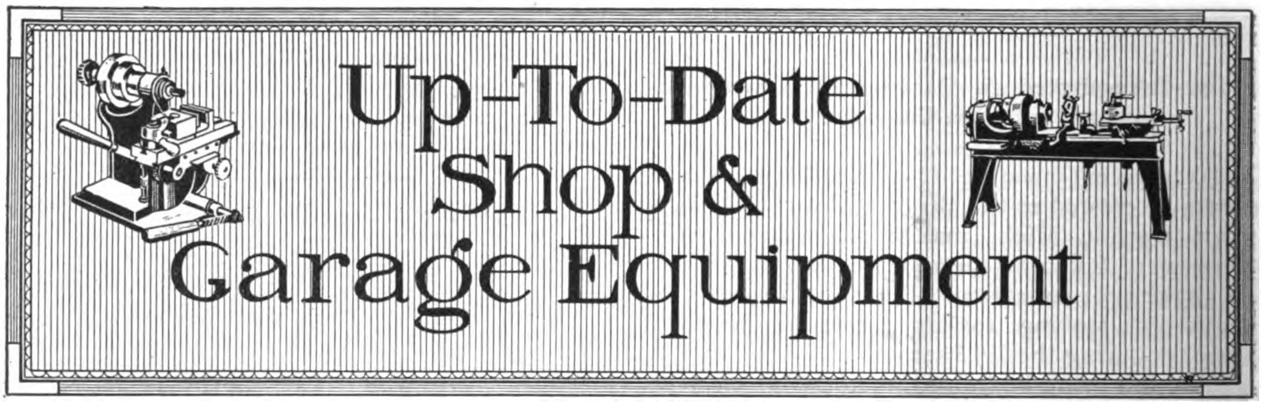
MOTOR PLOWS IN CALIFORNIA.

Union Tool Company Erecting Factory for Production of Industrial Vehicles.

Ground has been broken for the erection of a factory to cost $100,000 to be built by the Union Tool Company at Torrance, Cal., near Los Angeles. The new plant will lie directly east of the Union Tool Company's $1,000,000 institution and between it and the $100,000 plant of the Pacific Metal Products Company, and will be used for the construction of traction plows and motor trucks. The building will occupy a space 82 wide by 240 feet long and it will be two stories in height.

The traction plow, which will be constructed on the lower floor, will be of 80 horsepower and will be capable of throwing four furrows at one time. The wheels will be six feet in height and the engine is placed directly over the forward axle. The construction of the new machine is really an innovation in the automobile business as far as the West is concerned and is planned for export trade, as well as for use in the southwest.

R. M. Owen & Co., 19 West 62nd street, New York City, has issued the annual Christmas number of the Reo Echo, a handsome 48-page brochure. Besides the 1913 Reo announcement well known automobile writers, all of which are illustrated. A copy will be mailed to those interested upon request.



Up-To-Date Shop & Garage Equipment

WHY THE TURNTABLE.

It is surprising the number of stables, etc., which have been converted into garages and many of these are not suited to the convenient storage of automobiles in that the building has either a long, narrow entrance to the main floor or the shape of the latter precludes easy entrance and exit when the majority of the spaces are occupied.

Under such conditions the customer is obliged to change speeds repeatedly in running his machine into its space, imposing unnecessary wear upon the mechanism, to say nothing of the possible damage to the other cars. Besides this is decidedly inconvenient to an owner who desires his machine in a hurry, especially if another customer is taking out his car.

These conditions are overcome by the turntable, which permits of swinging the machine to any desired angle. Another quality of the device is that considerable time is saved by the night washer, who is enabled to roll the machine upon the table, rotate it, and push the car to the washstand without unnecessarily straining the steering mechanism.

In order to meet the demand for a turntable which may be installed without making alterations to the garage floor, the T. C. Beach Company, Inc., St. Johns, Mich., is manufacturing a pitless table. The design is such that the use of tracks, trucks or wheels is eliminated and its installation does not require the services of an expert. It comes complete and the only work required is to bolt it to the floor.

The standard type steel table is shown at Fig. 1, the drawings illustrating the top and sectional views, and the table is made in five diameters, ranging from 10 feet to 16, with wheelbase limits of 92 to 170 inches. The table is counter balanced and rotates on high grade ball bearings of ample size, as will be noted in the illustration.

The same principle is utilized with the pitless table. The rigid steel frame revolves just above the floor and is provided with two steel runways fitted with automatic approaches at the ends, allowing the car to be run on or off at any point as with the standard type. This design eliminates the pit, and is easily installed. It is made in five sizes, with table diameters ranging from 10 to 15 feet and wheelbase limits of 92 to 156 inches.

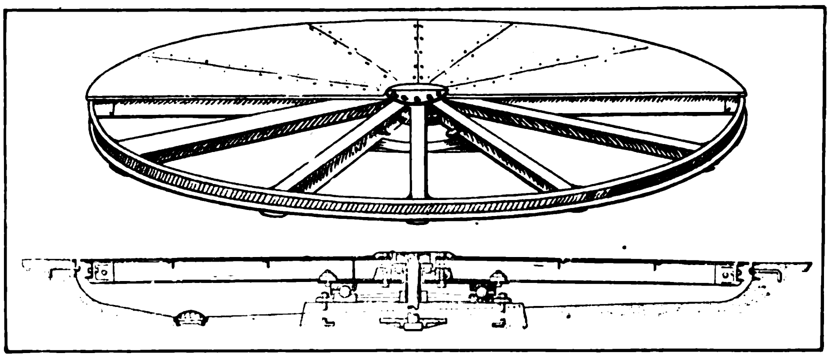


Fig. 1—The Beach Ball Bearing Automobile Turntable.

HISEY ELECTRIC TOOL POST GRINDER.

The Hisey portable electric tool post grinder, manufactured by the Hisey-Wolf Machine Company, Cincinnati, O., is designed for a variety of work, such as grinding lathe centres, cutters, reamers, dies, rolls, etc., and for surface, parallel and internal work of all kinds. It is made in two types, A and B, operated by a 110 and 220-volt direct current and comes complete with wheels, cord and attachment plug. With the 110-volt grinder the following parts are furnished: One emery wheel, 4.5 by .375 inches with a .5-inch hole; one extension mandrel, 4.5 inches long by .75 inch diameter, with wheel 1.5 by .375 inches with .375-inch hole, and one tool rest.

The extension mandrel is utilized for internal grinding by removing the regular wheel and screwing the mandrel to the spindle. The latter is equipped with special bronze bearings, adjustable to wear, and provided with dust proof caps, these preventing foreign elements from reaching the working parts. The brush holders are also enclosed protecting the operator, and may be renewed easily without disturbing the leads.

The motor is air-cooled by means of a fan attached to the armature spindle. A quality claimed for the tool is that rotation of the emery wheel may be reversed by simply changing the position of the two wires on top of the motor housing, the operation requiring no tools.

The V slide has a three-inch travel by means of a worm, through the handle, and is fitted with a gib to take up any wear. It is held in position with a screw clamp, so that different sized shanks may be employed. The tooth rest is an attachment and serves as an index for grinding cutters, reamers, etc. Each attachment plug has a fusible cap protecting the motor from overload. The speed of the type A grinder under load is 4200 revolutions a minute. The dimensions are 4.25 by 7.75 inches, and the weight 16 pounds.

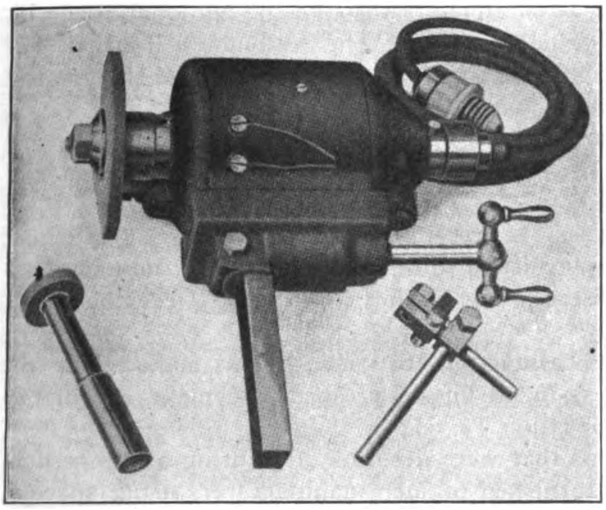


Fig. 2—The Hisey Direct Current Portable Electric Tool Post Grinder.

AIR COMPRESSOR LUBRICATION.

The lubrication of air compressors deserves careful attention, says Graphite, and a common fault is to use too much oil or a lubricant having too low a flash point. An air compressor does not require as much lubrication as a steam cylinder and too much tends to cause the valves to stick, thereby necessitating frequent cleaning. The use of kerosene for removing the deposits is not recommended as it is likely to produce an explosion.

A practical method of lubricating the cylinders of air compressors is with a mixture of soapy water and flake graphite. Such a combination is not only safe to utilize, but keeps the valves clean. The use of a little oil is recommended when shutting down the compressor to prevent any tendency of the soap suds to cause rusting. The Joseph Dixon Crucible Company, Jersey City, N. J., publishes a booklet upon the subject which will be mailed free upon request.

TIRE PUMP HINTS.

Many times the tire pump is condemned as faulty and thrown away when a little work would place the member in good operating condition. It should be borne in mind that the pump has to overcome the pressure of the inner tube valve and as the tube becomes inflated the pressure is increased.

When the pump packing or washer on the plunger becomes dry, air will escape past these members, a condition usually denoted by a hissing sound. The remedy is to unscrew the cap on the pump cylinder, pull out the plunger and soften the packing with a little hard grease. It is advisable to allow the grease to soak in thoroughly over night before reassembling the parts. If a leather washer is fitted, and it has become compressed, open the material as an umbrella.

If caught upon the road with a pump that cannot apparently overcome the pressure in the tube, loosen the valve by unscrewing and it is surprising how easily the tire may be inflated. The valve should be readjusted after the work and tested for leaks.

NEW BEARING METAL.

A new bearing metal is being marketed abroad, called phosforum, and it is particularly adapted for plain bearings. One of the difficulties encountered in the selection of a suitable metal for this purpose has always been in regard to the homogeneity of the cast material; in which segregation occurs. The new metal is cast in stick and bushing form and it is said to eliminate entirely the troubles experienced through occasional variations in metalling and casting temperatures.

VISO SPARK PLUG.

Provision Is Made for Noting the Condition of the Points at All Times.

When a cylinder misses the usual practise is to remove and test the plug. This involves disconnecting the wiring, etc. The Rapp Manufacturing Company, Toledo, O., is marketing a plug known as the Viso. Among the features of the plug is a window through which the action of the spark may be seen. If a flame is noted at the gap and ignition fails, it indicates that the points of the plug are fouled. The gap is adjustable by setting a nut which permits of increasing the space for the high-tension current to jump. This is held to intensify the spark and break down all oil or carbon between the points.

VISO
TOLEDO, OHIO

Viso Spark Plug.

Announcement is made by the company to the effect that it is to move into new and more commodious quarters. The new building will provide 2000 square feet of floor space, which will permit doubling the present output. The company has been in business but four months. The officers of the growing concern are: President, H. A. Nummell; vice president, J. R. Schackne; secretary, C. D. Few; treasurer, Clifford Stone.

A Service That Earns Millions

Business aggregating millions of dollars is transacted annually through the National Trade Information Exchange conducted in connection with the publication of The Automobile Journal, The Motor Truck and The Accessory and Garage Journal. Without question, this is one of the greatest buying and selling channels in the whole automobile industry.

Only yearly advertisers in The Automobile Journal, The Motor Truck or the Accessory and Garage Journal are entitled to enjoy the rights and benefits of this Exchange—the only exchange of its kind in existence.

Actual proof of the services rendered—not promises—is presented in the following list of names of individuals and concerns. This list is one of many furnished to our patrons and all the names appearing thereon were received and mailed to advertisers in our publications during December, 1912, and all have been acted upon by them.

Products wanted are shown under proper classifications and to some extent make clear the scope of this service and the opportunities for business in all lines for those who make use of this Exchange. Full details will be forwarded upon application.

More than 300 names of individuals and concerns that were desirous of securing a line or lines of pleasure cars and commercial vehicles have been furnished to such manufacturers using space in our magazines during the past three months. The conditions under which this service is supplied do not permit this list to be published.

Service is what you want; service is what you pay for. We have the service to sell.

MISCELLANEOUS PRODUCTS.

Recording Devices for Trucks.

Pettis Dry Goods Co., Indianapolis, Ind.

Literature Pertaining to Eight-Cylinder Automobiles and Others Having More Than Six Cylinders.

Robert L. Moore, Lincoln Road, Wayland, Mass.

Steel or Wood Block Motor Truck Tires.

E. DeLoriere, Jerome, Arizona.

Tires Other Than Pneumatic for Light Automobiles.

C. S. Ayres, Prescription Druggist, Carlisle, Ark.

Underground Gasoline Tanks.

T. G. Bloom, 425 Market St., Osage City, Kan.

All Kinds of Accessories Pertaining to Motor Truck.

W. S. Schmitz, Gen. Mgr., 237-241 Collins Ave., East End, Pittsburg, Pa.

Fire Extinguishers and Cleaning Guns.

Lamay Mfg. Co., 203 State St., Rochester, N. Y.

Power Air Pumps.

Rockingham Garage, 48 Vaughn St., Portsmouth, N. H.

Portable Garages.

Central Falls Mazda Lamp Co., H. T. Jimeon, Central Falls, R. I.

AUTOMOBILE AND POWER WAGON EQUIPMENT, ACCESSORIES AND SUPPLIES.

W. R. Campbell, Evart, Mich.
R. C. Hathorn, White River Junction, Vt.
Leonia Garage Co., Central and Highland Aves., Leonia, N. J.
N. V. & H. N. Porter, 416 Bank St., New London, Conn.
Donaldsonville Garage & Auto Supply Co., Donaldsonville, La.
Hailey Auto Co., Hailey, Idaho.
West End Garage Co., Sixth and Main Sts., Santa Ana, Cal.
L. P. Halladay Co., Monroe St. and Broadway, P. O. Box 344, Streator, Ill.
True & Blanchard Co., Main St., Newport, Vt.
John S. Bridges, 26 S. Charles St., Baltimore, Md.
The Rubernix Mfg. Co., 329 Broadway, Toledo, O.
William H. Ahrens, Leonia, N. J.
Overland Wisconsin Co., 458-60 Milwaukee St., Milwaukee, Wis.
Koehler & Hanson, Odebolt, Ia.
A. M. Zimbrich, 21 Plymouth Ave., S., Rochester, N. Y.
William J. Damoth, Coopersville, Mich.
Kirby & Hubbard, 21 East Front St., Red Bank, N. J.
Pittsburg Motor Service Corp., First Ave. & West Water St., Pittsburg, Penn.
J. A. Fritz & Co., E. Lawrence Ave., Charlotte, Mich.
Moses Salmson, Whitelock St., Cor. Callow Ave., Baltimore, Md.
The Randall-Faichney Co., Atherton St., Jamaica Plain, Boston, Mass.
Four Wheel Drive Auto Co., Clintonville, Wis.
Brown-Symonds Co., Pico St., Los Angeles, Cal.
F. T Wavelruff & Co., 244 Purchase St., New Bedford, Mass.
New England Garage Co., 230 Main St., Hartford, Conn.
Wm. Wenkenbach Sons, 1314 Germantown Ave., Philadelphia, Penn.
Pilcher Auto Co., Sac City, Ia.
Saline Auto Co., Atten. A. J. Cleveland, 212-14 North Santa Fe St., Saline, Kan.
Sheboygan Auto & Supply Co., 816 Niagara Ave., Sheboygan, Wis.
Whittier Garage Co., Cor. Philadelphia and Newlin Sts., Whittier, Cal.
Home Auto Co., McKenzie St., Luverne, Mass.
Grafton Motor Co., Grafton, W. Va.
Bythrow & Paddon, 198 Pleasant St., Boston, Mass.
port, Ky.
Twin City Auto Co., Market St., Chehalis, Wash.
Scott Motor Co., 401-4 Central Bank Bldg., Memphis, Tenn.
Central Automobile Co. of Ky., Inc., 209 York St., New-
Campbell Auto Co., 49 W. 4th St., Sale Lake City, Utah.
Modoc Motor Car Co., 618 Chicago Ave., Chicago, Ill.
Painter-Dunn Co., 609 Neville St., Pittsburg, Penn.
The Reliance Truck & Garage Co., 111-15 East Lynn St., Columbus, O.
Walter Williamson Automobile Co., 127 Church St., New Brunswick, N. J.
Pioneer Motor Car Co., 251 River St., Troy, N. Y.
Southern Taxicab Co., 325½ So. High St., Columbus, O.
Edward C. Baxter, Smithtown, Long Island, N. Y.
W. C. Hosford, 288 St. Botolph St., Boston, Mass.
Clifton Automobile Co., 132-134 Third St., Union Hill, N. J.
Ch. F. Moeller & Son, 615-17 E. Jersey St., Elizabeth, N. J.
John O'Donnell, 19 Messer St., Providence, R. I.
Noel Bros., 216 N. Main St., Elkhart, Ind.
W. E. Blake, 65 N. Main St., Ansonia, Conn.
Pope-Hartford Co. of Boston, 591 Boylston St., Boston, Mass.
J. K. Gewinner, 124 Peachtree St., Atlanta, Ga.
A. L. Crowthers, 222 Main St., Coshocton, O.
C. E. Niblette, 115 Chenango St., Binghamton, N. Y.
California Novelty Art Co., 618 So. Olive St., Los Angeles, Cal.
Hopkinsville Cadillac Co., So. Main St., Hopkinsville, Ky.
Frank Kostlan, Traer, Ia.
Colonial Automobile Co., 3948-50 Olive St., St. Louis, Mo.
Furcht, Fowler & Stinson Auto Co., Hailey, Idaho.
Brand Boulevard Garage, Glendale, Cal.
Capt. John J. Seay-McCartha Garage, East First St., Rome, Ga.
Barker, Rose & Clinton, Elmira, N. Y.
Kellogg & Taggart, 220 E. B'way, Mt. Pleasant, Mich.
Central Garage Co., 124-32 Third Ave., N., Nashville, Tenn.
Lutz & Weaver, Front Ave., Ashland, Ky.
White Pole Garage, West Main St., Anita, Ia.
The Adirondack Motor Co., Hudson Falls, N. Y.
Mr. Harry Worline, Caldwell Garage, Frankfort, Ind.
Shafer-Decker Co., 1135 University Ave., Rochester, N. Y.
C. B. DeLong, Fithian, Ill.
Galva Auto Co., Galva, Ia.

Park Garage Co., 419 First St., Henderson, Ky.
The Wyoland Automobile Co., Central Ave., Wyoming, O.
Grayling Machine Repair Co., Box 391, Grayling, Mich.
J. P. Grinnell, High St., Wakefield, R. I.
Davis B. Roberts, Buick Garage, 356 Main St., Hartford, Conn.
Corinth Auto Co., Corinth, Miss.
Central Auto Supply Co., 1404 18th St., Bakersfield, Cal.
The Everitt Auto Sales Co., 307-9 Mt. Vernon Ave., Columbus, O.
Chase Motor Truck Sales Co., Minneapolis, Minn.
Sword Mfg. Co., Main St., New London, Conn.
Santa Monica Auto Sta., 206-10 Santa Monica Blvd., Santa Monica, Cal.
National Automobile Owners' Association, 23 So. Main St., Asbury Park, N. J.
Tudor Garage Co., 143 Washington Ave., Chelsea, Mass.
Lavern & Halstron, 126 Washington St., Mankato, Minn.
Wm. E. Baumert, Big Arm, Mont.
The Auto Tire Filling Co. of Md. & D. C., 2207-9 Madison St., Baltimore, Md.
Guy C. Clary, Clearmont, Mo.
A. H. Meester, So. Main St., Ellsworth, Minn.
Lafayette Motor Car Co., 223 No. 3rd St., Easton, Penn.
City Hall Garage Co., Inc., Union Street, Paterson, N. J.
Pioneer Commercial Auto Co., 1017-19 Alameda St., Los Angeles, Cal.
The Hydraulic Auto-Truck Corp., 1306 South Grand St., Los Angeles, Cal.
Van Vliet-Bradt Automobile Co., 919 Locust St., Des Moines, Ia.
Columbia Auto & Machine Co., Cor. 6th & Columbia Ave., Hood River, Ore.
Rothwell Garage & Sales Co., 602 So. Ashley St., Ann Arbor, Mich.
The Southern Motors Co., 615 So. 3rd Ave., Louisville, Ky.
Henry G. Ehredt, 523 E. 8th Ave., Homestead, Penn.
Eddie Motor Wks., So. Fairoaks & Centre St., Pasadena, Cal.
Oregon Mining & Brokerage Co., P. O. Box 321, Grants Pass, Ore.
W. J. Bingham, 66 Stanhope St., Boston, Mass.
Schornstein Auto Co., Cor. Hudson & Bates Ave., St. Paul, Minn.

GARAGE AND REPAIR SHOP EQUIPMENT.

W. R. Campbell, Evart, Mich.
Leonia Garage Co., Central & Highland Aves., Leonia, N. J.
R. C. Hathorn, White River Junc., Vt.
N. V. & H. N. Porter, 416 Bank St., New London, Conn.
The Broad Oak Auto Co., 621 E. Oak St., Columbus, O.
West End Garage Co., 6th & Main St., Santa Ana, Cal.
True & Blanchard, Main St., Newport, Vt.
John S. Bridges, 26 S. Charles St., Baltimore, Md.
Wm. H. Ahrens, Leonia, N. J.
Overland Wisconsin Co., 458-60 Milwaukee St., Milwaukee, Wis.
Koehler & Hanson, Odebolt, Ia.
A. M. Zimbrich, 21 Plymouth Ave., So., Rochester, N. Y.
Kirby & Hubbard, 21 East Front St., Red Bank, N. J.
F. W. Sawyer, Bar Harbor, Me.
Pittsburg Motor Service Corp., First Ave. & West Water St., Pittsburg, Penn.
J. A. Fritz & Co., E. Lawrence Ave., Charlotte, Mich.
F. T. Wavelruff & Co., 244 Purchase St., New Bedford, Mass.
Brown-Symonds Co., Pico St., Los Angeles, Cal.
New England Garage Co., 230 Main St., Hartford, Conn.
Wm. Wenkenbach Sons, 1314 Germantown Ave., Philadelphia, Penn.
Sheboygan Auto & Supply Co., 816 Niagara Ave., Sheboygan, Wis.
Whittier Garage Co., Cor. Philadelphia & Newlin Sts., Whittier, Cal.
Home Auto Co., McKenzie St., Luverne, Minn.
Grafton Motor Co., Grafton, W. Va.
Central Automobile Co. of Ky., 209 York St., Newport, Ky.
Scott Motor Co., 401-4 Central Bank Bldg., Memphis, Tenn.
Campbell Auto Co., 49 W. 4th St., Salt Lake City, Utah.
Painter-Dunn Co., 609 Neville St., Pittsburg, Penn.
The Reliance Truck & Garage Co., 111-15 East Lynn St., Columbus, O.
Walter Williamson Automobile Co., 127 Church St., New Brunswick, N. J.
Pioneer Motor Car Co., 251 River St., Troy, N. Y.
Southern Taxicab Co., 325½ So. High St., Columbus, O.
Oregon Mining & Brokerage Co., P. O. Box 321, Grants Pass, Ore.
W. J. Bingham, 66 Stanhope St., Boston, Mass.
The Kline Kar Motor Co., Pittsburg, Penn.
Edward C. Baxter, Smithtown, Long Island, N. Y.
W. C. Hosford, 288 St. Botolph St., Boston, Mass.
Clifton Automobile Co., 132-134 Third St., Union Hill, N. J.
Ch. F. Moeller & Son, 615-17 E. Jersey St., Elizabeth, N. J.
John O'Donnell, 19 Messer St., Providence, R. I.
Noel Bros., 216 N. Main St., Elkhart, Ind.
J. K. Gewinner, 124 Peachtree St., Atlanta, Ga.
Pope-Hartford Co. of Boston, 591 Boylston St., Boston, Mass.
Union Motor Car Co., Washington, Penn.
A. L. Crowthers, 222 Main St., Coshocton, O.
C. E. Niblette, 115 Chenango St., Binghamton, N. Y.
Rockingham Garage, 48 Vaughn St., Portsmouth, N. H.
Frank Kostlam, Traer, Ia.
Colonial Automobile Co., 3948-50 Olive St., St. Louis, Mo.
Furcht, Fowler & Stinson Auto Co., Hailey, Idaho.
Lavens & Halston, 126 Washington St., Mankato, Minn.
Tudor Garage Co., 143 Washington Ave., Chelsea, Mass.
National Automobile Owners' Association, 23 S. Main St., Asbury Park, N. J.
Santa Monica Auto Sta., 206-10 Santa Monica Blvd., Santa Monica, Cal.
Sword Mfg. Co., Main St., New London, Conn.
Chase Motor Truck Sales Co., Inc., Minneapolis, Minn.
The Everitt Auto Sales Co., 307-9 Mt. Vernon Ave., Columbus, O.
Central Auto Supply Co., 1404 18th St., Bakersfield, Cal.
Corinth Auto Co., Corinth, Miss.
Davis B. Roberts, Buick Garage, 356 Main St., Hartford, Conn.
J. P. Grinnell, High St., Wakefield, R. I.
Park Garage Co., 419 First St., Henderson, Ky.
Galva Auto Co., Galva, Ia.
S. B. DeLong, Fithian, Ill.
Shafer-Decker Co., 1135 University Ave., Rochester, N. Y.
Mr. Harry Worline, Caldwell Garage, Frankfort, Ind.
Adirondack Motor Car Co., Hudson Falls, N. Y.
White Pole Garage, West Main St., Anita, Ia.
Page Auto Hoist & Specialty Mfg. Co., Madison Ave. & P. M. Tracks, Grand Rapids, Mich.
Lutz & Weaver, Front Ave., Ashland, Ky.
Central Garage Co., 124-32 Third Ave., N., Nashville, Tenn.
Kellogg & Taggart, 220 East B'way, Mt. Pleasant, Mich.
Capt. John H. Seay-McCartha Garage, East First St., Rome, Ga.
Rothwell Garage & Sales Co., 602 S. Ashley St., Ann Arbor, Mich.
Columbia Auto & Machine Co., Cor. 6th & Columbia Ave., Hood River, Ore.
Van Vliet-Bradt Automobile Co., 919 Locust St., Des Moines, Ia.
Hydraulic Auto-Truck Corp., 1306 South Grand St., Los Angeles, Cal.
Central Ave. Garage, 934-6 Rose St., Reading, Penn.
Pioneer Commercial Auto Co., 1017-19 Alameda St., Los Angeles, Cal.
Lafayette Motor Car Co., 223-35 No. Third St., Easton, Penn.
A. H. Meester, So. Main St., Ellsworth, Minn.
Guy C. Clary, Cleamont, Mo.
Auto Tire Filling Co. of Md. & D. C., 2207-9 Madison Avenue, Baltimore, Md.
W. E. Baumert, Big Arm, Mont.
Eddie Motor Wks., So. Fairoaks & Centre St., Pasadena, Cal.
Henry G. Ehredt, 523 E. 8th Ave., Homestead, Penn.
Saline Auto Co., 212-14 N. Santa Fe St., Saline, Kan. Atten. A. J. Cleveland.

GARAGE AND REPAIR SHOP SUPPLIES.

W. R. Campbell, Evart, Mich.
Leonia Garage Co., Central & Highland Aves., Leonia, N. J.
R. C. Hathorn, White River Junc., Vt.
N. V. & H. N. Porter, 416 Bank St., New London, Conn.
Donaldsonville Garage & Auto Supply Co., Donaldsonville, La.
Hailey Auto Co., Hailey, Idaho.
The Broad Oak Auto Co., 621 E. Oak St., Columbus, O.
West End Garage Co., 6th & Main St., Santa Ana, Cal.
L. P. Halladay Co., Monroe St. & B'way, P. O. Box 344, Streator, Ill.
True & Blanchard Co., Main St., Newport, Vt.
John S. Bridges, 26 S. Charles St., Baltimore, Md.
The Rubernix Mfg. Co., 329 B'way, Toledo, O.
Wm. H. Ahrens, Leonia, N. J.
Overland-Wisconsin Co., 458-60 Milwaukee St., Milwaukee, Wis.
Keohler & Hanson, Odebolt, Ia.
A. M. Zimbrich, 21 Plymouth Ave., So., Rochester, N. Y.
Wm. J. Damoth, Coopersville, Mich.
Kirby & Hubbard, 21 E. Front St., Red Bank, N. J.
Pittsburg Motor Service Corp., First Ave. & W. Water St., Pittsburg, Penn.
J. A. Fritz & Co., E. Lawrence Ave., Charlotte, Mich.
Moses Salmson, Whitelock St., Cor. Callow Ave., Baltimore, Md.
Randall-Faichney Co., Atherton St., Jamaica Plain, Boston, Mass.
F. T. Wavelruff & Co., 244 Purchase St., New Bedford, Mass.
Brown-Symonds Co., Pico St., Los Angeles, Cal.
New England Garage Co., 230 Main St., Hartford. Conn.
Wm. Wenkenbach Sons, 1314 Germantown Ave., Philadelphia, Penn.

Schornstein Auto Co., Cor. Hudson & Bates Ave., St. Paul, Minn.
Saline Auto Co., Atten. A. J. Cleveland, 212-14 North Santa Fe St., Saline, Kan.
Sheboygan Auto & Supply Co., 816 Niagara Ave., Sheboygan, Wis.
Whittier Garage Co., Cor. Phil. & Newlin Sts., Whittier, Cal.
Home Auto Co., McKenzie St., Luverne, Minn.
Grafton Motor Co., Grafton, W. Va.
The Central Automobile Co. of Ky., Inc., 209 York St., Newport, Ky.
Twin City Auto Co., Market St., Chehalis, Wash.
Scott Motor Co., 401-4 Central Bank Bldg., Memphis, Tenn.
Campbell Auto Co., 49 W. 4th St., Salt Lake City, Utah.
Reliance Truck & Garage Co., 111-15 East Lynn St., Columbus, O.
Painter-Dunn Co., 609 Neville St., Pittsburg, Penn.
Pioneer Motor Car Co., 251 River St., Troy, N. Y.
Southern Taxicab Co., 325½ So. High St., Columbus, O.
Edward C. Baxter, Smithtown, Long Island, N. Y.
Kline Kar Motor Co., Pittsburg, Penn.
W. C. Hosford, 288 St. Botolph St., Boston, Mass.
Clifton Automobile Co., 132-134 Third St., Union Hill, N. J.
Ch. F. Moeller & Son, 615-17 E. Jersey St., Elizabeth, N. J.
John O'Donnell, 19 Messer St., Providence, R. I.
Noel Bros., 216 N. Main St., Elkhart, Ind.
W. E. Blake, 65 N. Main St., Ansonia, Conn.
Pope-Hartford Co. of Boston, 591 Boylston St., Boston, Mass.
J. K. Gewinner, 124 Peachtree St., Atlanta, Ga.
A. L. Crowthers, 222 Main St., Coshocton, O.
C. E. Niblette, 115 Chenango St., Binghamton, N. Y.
Hopkinsville Cadillac Co., S. Main St., Hopkinsville, Ky.
Frank Kostlan, Traer, Ia.
Furcht, Fowler & Stinson Auto Co., Hailey, Idaho.
Oregon Mining & Brokerage Co., P. O. Box 321, Grants Pass, Ore.
W. J. Bingham, 66 Stanhope St., Boston, Mass.
Barker, Rose & Clinton, Elmira, N. Y.
Kellogg & Taggart, 220 E. B'way, Mt. Pleasant, Mich.
Central Garage Co., 124-32 3rd Ave., N., Nashville, Tenn.
Page Auto Hoist & Specialty Mfg. Co., Madison Ave. & P. M. Tracks, Grand Rapids, Mich.
White Pole Garage, W. Main St., Anita, Ia.
Adirondack Motor Car Co., Hudson Falls, N. Y.
Harry Worline, Caldwell Garage, Frankfort, Ind.
Shaffer-Decker Co., 1135 University Ave., Rochester, N. Y.
C. B. DeLong, Fithian, Ill.
Galva Auto Co., Galva, Ia.
Park Garage Co., 419 1st St., Henderson, Ky.
Grayling Machinery Repair Co., Box 391, Grayling, Mich.
Davis B. Roberts, Buick Garage, 356 Main St., Hartford, Conn.
J. P. Grinnell, High St., Wakefield, R. I.
Corinth Auto Co., Corinth, Miss.
The Everitt Auto Sales Co., 307-9 Mt. Vernon Ave., Columbus, O.
Chase Motor Truck Sales Co., Inc., Minneapolis, Minn.
Sword Mfg. Co., Main St., New London, Conn.
Santa Monica Auto Sta., 206-10 Santa Monica Blvd., Santa Monica, Cal.
National Automobile Owners' Association, 23 S. Main St., Asbury Park, N. J.
Tudor Garage Co., 143 Washington Ave., Chelsea, Mass.
W. E. Baumert, Big Arm, Mont.
The Auto Tire Filling Co. of Md. & D. C., 2207-9 Madison Ave., Baltimore, Md.
Guy C. Clary, Clearmont, Mo.
A. H. Meester, Ellsworth Garage, Ellsworth, Minn.
Lafayette Motor Car Co., 223 No. 3rd St., Easton, Penn.
City Hall Garage Co., Inc., 25-29 Union St., Paterson, N. J.
Pioneer Commercial Auto Co., 1017-19 Alameda St., Los Angeles, Cal.
The Hydraulic Auto-Truck Corp., 1306 South Grand St., Los Angeles, Cal.
Central Ave. Garage, 934-36 Rose St., Reading, Penn.
Van Vliet-Bradt Automobile Co., 919 Locust St., Des Moines, Ia.
Columbia Auto & Mach. Co., Cor. 6th & Columbia Ave., Hood River, Ore.
Rothwell Garage & Sales Co., 602 So. Ashley St., Ann Arbor, Mich.

MACHINE TOOLS.

The Auto Tire Filling Co. of Md. & D. C., 2207-9 Madison Ave., Baltimore, Md.
W. R. Campbell, Evart, Mich.
Leonia Garage, Central & Highland Aves., Leonia, N. J.
R. C. Hathorn, White River Junc., Vt.
N. V. & H. N. Porter, 416 Bank St., New London, Conn.
True & Blanchard, Main St., Newport, Vt.
William H. Ahrens, Leonia, N. J.
Overland Wisconsin Co., 458-60 Milwaukee St., Milwaukee, Wis.
Keohler & Hanson, Odebolt, Ia.
A. M. Zimbrich, 21 Plymouth Ave. S., Rochester, N. Y.
Kirby & Hubbard, 21 East Front St., Red Bank, N. J.
F. W. Sawyer, Bar Harbor, Me.
J. A. Fritz & Co., E. Lawrence Ave., Charlotte, Mich.
The Randall-Faichney Co., Atherton St., Jamaica Plain, Boston, Mass.
Four Wheel Drive Auto Co., Clintonvile, Wis.
F. T. Wavelruff & Co., 244 Purchase St., New Bedford, Mass.
Brown-Symonds Co., Pico St., Los Angeles, Cal.
Wm. Wenkenbach Sons, 1314 Germantown Ave., Philadelphia, Penn.
Saline Auto Co., Atten. A. J. Cleveland, 212-14 N. Santa Fe St., Saline, Kan.
Sheboygan Auto & Sup. Co., 816 Niagara Ave., Sheboygan, Wis.
Whittier Garage Co., Cor. Phila. & Newlin Sts., Whittier, Cal.
Home Auto Co., McKenzie St., Luverne, Minn.
Grafton Motor Co., Grafton, W. Va.
Campbell Auto Co., 49 W. 4th St., Salt Lake City, Utah.
Painter-Dunn Co., 609 Neville St., Pittsburg, Penn.
Pioneer Motor Car Co., 251 River St., Troy, N. Y.
Southern Taxicab Co., 325½ So. High St., Columbus, O.
Edward C. Baxter, Smithtown, Long Island, N. Y.
W. C. Hosford, 288 St. Botolph St., Boston, Mass.
Clifton Automobile Co., 132-34 Third St., Union Hill, N. J.
Noel Bros., 216 N. Main St., Elkhart, Ind.
Pope-Hartford Co. of Boston, 591 Boylston St., Boston, Mass.
J. K. Gewinner, 124 Peachtree St., Atlanta, Ga.
Union Motor Car Co., Washington, Penn.
A. L. Crowthers, 222 Main St., Coshocton, O.
C. E. Niblette, 115 Chenango St., Binghamton, N. Y.
Hopkinsville Cadillac Co., S. Main St., Hopkinsville, Ky.
Furcht, Fowler & Stinson Auto Co., Hailey, Idaho.
W. J. Bingham, 66 Stanhope St., Boston, Mass.
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National Automobile Owners' Association, 23 S. Main St., Asbury Park, N. J.
Santa Monica Auto Sta., 206-10 Santa Monica Blvd., Santa Monica, Cal.
Sword Mfg. Co., Main St., New London, Conn.
Chase Motor Truck Sales Co., Inc., Minneapolis, Minn.
The Everitt Auto Sales Co., 307-9 Mt. Vernon St., Columbus, O.
Corinth Auto Co., Corinth, Miss.
Davis B. Roberts, Buick Garage, 356 Main St., Hartford, Conn.
C. B. DeLong, Fithian, Ill.
Shafer-Decker Co., 1135 University Ave., Rochester, N. Y.
Harry Worline, Caldwell Garage, Frankfort, Ind.
Adirondack Motor Car Co., Hudson Falls, N. Y.
Page Auto Hoist & Specialty Mfg. Co., Madison Ave. & P. M. Tracks, Grand Rapids, Mich.
Rothwell Garage & Sales Co., 602 So. Ashley St., Ann Arbor, Mich.
Van Vliet-Bradt Automobile Co., 919 W. Locust St., Des Moines, Ia.
Hydraulic Auto Corp., 1306 So. Grand St., Los Angeles, Cal.
Pioneer Commercial Auto Co., 1017-19 Alameda St., Los Angeles, Cal.
City Hall Garage Co., Inc., 25-29 Union St., Paterson, N. J.
Lafayette Motor Car Co., 233-35 No. 3rd St., Easton, Penn.
A. H. Meester Auto Co., So. Main St., Ellsworth Garage, Ellsworth, Minn.
Guy C. Clary, Clearmont, Mo.

GAS TUBING WILL CLOG.

Where copper or brass tubing is utilized to convey acetylene gas from tank or generator to lamps, it should be removed and cleaned at regular intervals. A carbon like deposit forms in the tubing and a number of tanks and generators that have been condemned as faulty were not able to force the gas through the clogged pipes. To clean the tubing it should be struck smartly against a flat board which will loosen the foreign matter.

FACE LOTION FOR MECHANICS.

A good lotion for removing grease and dirt from the face and hands can be made according to the following formula, says a contributor to Popular Mechanics. To seven ounces of pure alcohol add one ounce of glycerine and a drop or two of camphor. This preparation not only dissolves the grease, but reduces the size of the pores in the skin, thus preventing the muddy appearance of some mechanics. The solution is quite harmless, and in cold weather will prevent cracked hands if used after washing.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Pontiac Motor Castings Company, Pontiac, Mich.; $8000; to manufacture steel and brass castings; incorporators, William J. Brown, T. E. Lyons, Peter J. Donnelly.

Northwestern Tire Company, Minneapolis, Minn.; $50,000; to deal in tires; incorporators, J. C. Roney, Frank J. Kerner, A. A. Kerner.

Jones Pneumatic Tire Spring Company, Hartford, Conn.; $100,000; incorporators, Lyman D. Jones, Etta E. Brandeau, Clarence R. Hall.

Superior Motor Company, Detroit, Mich.; $100,000; to manufacture and sell combustion engines and accessories; incorporators, Henry Fraser, Walter G. Schmeider, Gaylor C. Brimmer.

The Rutzen Power Company, Cleveland, O.; $100,000; to control patents of and to manufacture the Rutzen motor; incorporators, D. W. Corbin, Francis J. Peck, D. H. Tilden, Alonzo M. Snyder, N. I. Young.

R. M. Allen Motor Sales Company, Cleveland, O.; $10,000; to deal in automobiles and automobile trucks; incorporators, Blanche M. Allen, R. M. Allen, H. W. Wiebush, T. B. Logan, H. C. Kagy.

Foreman Motor & Machine Company, Toronto, Can.; $40,000 to manufacture engines; incorporators, W. J. Brown, G. H. Foreman, T. H. Sharp.

Premier Agency Company, Indianapolis, Ind.; $30,000; to deal in automobiles; incorporators, T. H. Adams, W. H. Foreman, J. W. Cowper, V. C. Vette, D. E. Sherrick, H. B. Wilson.

General Oil Manufacturing Company, Jersey City, N. J.; $50,000; to manufacture oil products; incorporators, G. E. Bennett, F. R. Jacobson, W. Perlis.

WITH THE MANUFACTURER

The B. F. Goodrich Company's branch on Boylston street, Boston, Mass., was visited recently by the students of the Boston Y. M. C. A. Automobile School. This was the second tour of inspection of plants in that city in connection with the course of study outlined by the association. The large stock of Goodrich tires and the methods used in the different departments were fully explained by several guides from the Goodrich staff, and much valuable information was gained concerning the care and repair of pneumatic tires. Of special interest was the demonstration of the necessary work in fitting motor truck wheels with solid rubber demountable equipment.

The Cartercar Company, Pontiac, Mich., maker of the Cartercar line, has found it necessary to open a factory branch at 242-244 Peachtree street, Atlanta, Ga., to look after its rapidly growing business in the South. W. C. Mahoney, who has been the special representative of the company in this district for some time has been appointed manager.

The Buick Motor Company, Flint, Mich., maker of Buick machines, at a recent meeting elected the following officers for the coming year: President, C. W. Nash, Flint; vice president, Thomas Neal, Detroit; treasurer, James T. Shaw, Detroit; secretary, Standish Backus, Detroit; assistant secretary and treasurer, F. A. Allen, Flint; comptroller, L. F. Ohland, Flint.

The Peerless Motor Car Company, Cleveland, O., maker of Peerless trucks and pleasure cars, has been authorized by its stockholders to increase its capital from $3,000,000 to $10,000,000. Present holders will get a 40 per cent. stock dividend and may exchange half of their enlarged holdings for an equal amount of preferred stock.

W. H. Barger, a pioneer automobile dealer in Cleveland, O., has been secured by the Thomas B. Jeffery Company, Kenosha, Wis., maker of Rambler Cross Country cars, as exclusive representative for this line in Cleveland and northwestern Ohio.

The Motz Tire & Rubber Company, maker of Motz tires, has just established a factory branch at 4436 Olive street, St. Louis, Mo., equipped to give service to all users of Motz tires and to care for Motz distribution in the St. Louis field. E. G. Seibel has been appointed manager.

Charles Y. Knight, inventor of the sliding sleeve valve motor, was in New York to attend the automobile shows. He came to this country direct from his home at Coventry, Eng., and will remain here until after the Chicago shows in February.

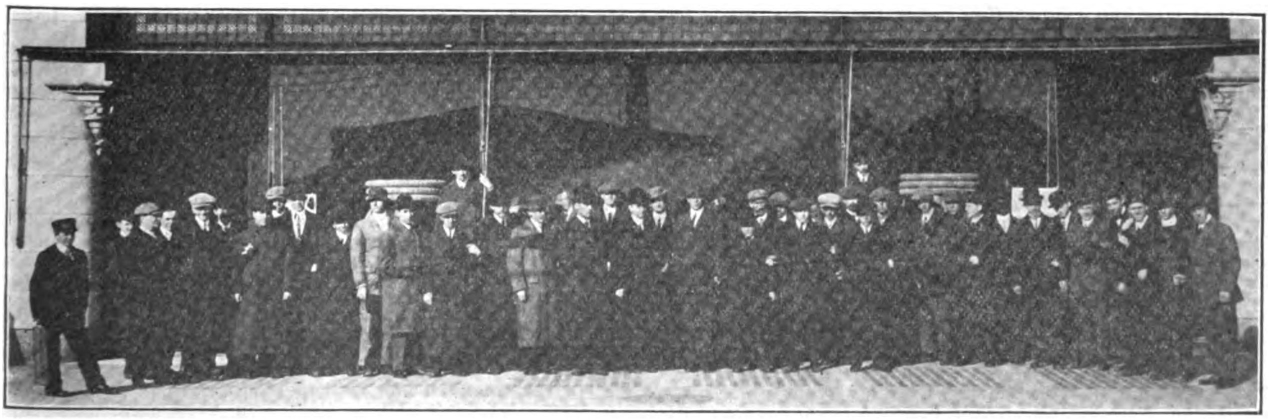
The King Motor Car Company, Detroit, maker of King cars, has announced the appointment of Ray B. Warman as export sales manager. Mr. Warman was export manager of the Scripps Motor Company and since taking that position has increased that company's export business to 52 per cent. of the total sales.

The Buick Motor Company, Flint, Mich., maker of Buick machines, is erecting a building at Peachtree and Harris streets, Atlanta, Ga., which is said to be one of the largest buildings of its kind in the world. It has 26,000 square feet. One entire floor will be given over to a complete stock of parts and another will comprise the service department. R. H. Losey is manager.

The Pope Manufacturing Company, Hartford, Conn., maker of Pope-Hartford machines, has voted to incorporate under the laws of Massachusetts. Stockholders will be offered the privilege of exchanging their Connecticut stock for shares of the Massachusetts corporation on a share-for-share basis.

G. D. Cairns sailed from New York, Dec. 28, for Buenos Aires, Argentine, to assume the management of the technical department of the Buick branch of the General Motors Export Company. Mr. Cairns was formerly associated with the Buick Motor Company of Philadelphia in a similar capacity.

The Cole Motor Car Company, Indianapolis, Ind., maker of Cole machines, has appointed the following distributors: Seanor & Williams Company, Beaver Falls, Penn.; L. A. Reynolds, Brockton, Mass.; Connellsville Garage, Connellsville, Penn.; Columbia Motor & Implement Company, Columbia, Tenn.; J. A. Vought, Charlevoix, Mich.; Doty Motor Company, David City, Neb.; Adam Eldam, Hazelton, Penn.; W. P. Marshall, Muskegon, Mich.; F. J. Robinson, Rochester, Vt.; Chamberlin Bros.,



Boston Y. M. C. A. Students on a Recent Tour of Inspection of the Local Branch of the B. F. Goodrich Company.

Salem, Ore.; Jacob Hinden, Strong City, Kan.; West Coast Auto Company, Tampa, Fla.; William Goode, Traverse City, Mich.; Vesper & Evans, Topeka, Kan.; E. L. Shefer, Williamsport, Penn.; Aaron Bricker, Berlin, Ont., Can.; Robert McIntosh, Saskatoon, Sask., Can.; Frank Campbell, Quebec, Can.; Moore & Pauline, Victoria, B. C.

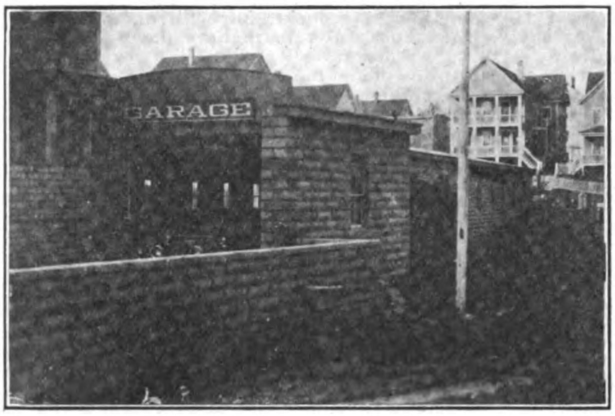
The Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, has established branch offices in the following cities: Atlanta, Ga.; Albany, N. Y.; Birmingham, Ala.; Baltimore, Md.; Boston; Brooklyn; Buffalo, N. Y.; Chicago; Charlotte, N. C.; Cincinnati, O.; Cleveland, O.; Columbus, O.; Detroit; Dayton, O.; Des Moines, Ia.; Denver, Col.; Grand Rapids, Mich.; Hartford, Conn.; Indianapolis, Ind.; Jacksonville, Fla.; Kansas City, Mo.; Louisville, Ky.; Los Angeles, Cal.; Minneapolis, Minn.; Milwaukee, Wis.; Memphis, Tenn.; New York City; New Orleans, La.; Newark, N. J.; Omaha, Neb.; Oakland, Cal.; Philadelphia; Providence, R. I.; Portland, Me.; Portland, Ore.; Pittsburg, Penn.; Rochester, N. Y.; San Francisco; St. Louis, Mo.; St. Paul, Minn.; Seattle, Wash.; Spokane, Wash.; Springfield, Mass.; Salt Lake City, Utah; San Diego, Cal.; Syracuse, N. Y.; Toledo, O.; Washington, D. C.; Worcester, Mass.; Mexico City, Mexico.

GARAGE & DEALER

The Munger Auto Company, Dallas, Tex., has occupied its new three-story building at 2213-15 Commerce street. The establishment is equipped with the latest facilities for the transaction of its business.

Otto J. Heimann of Chicago is planning to erect a 1.5-story garage on North Robey street, that city.

The Birmingham Motor Company, Birmingham, Ala., is to erect a new building to be used as a salesroom and garage, to cost $10,000. Leo Loeb, manager of the company, stated that the new establishment will be modern in every particular.



Horton's Garage, Fall River, Mass., Headquarters for K-R-I-T and Crow Elkhart Models.

S. E. Drake, Lexington, Ky., has leased quarters at 234 East Main street and will carry in stock a full equipment of all models of Overland cars, made by the Willys-Overland Company, Toledo, O., and also a complete line of accessories.

The Swarts Automobile Company, St. Louis, Mo., which has the St. Louis territory for the Velie machines, made by the Velie Motor Vehicle Company, Moline, Ill., has moved to larger quarters at 5143 Delmar avenue.

Horton's Garage, Fall River, Mass., is headquarters for that city and vicinity for the K-R-I-T cars, made by the K-R-I-T Motor Car Company, Detroit, and the Crow Elkhart line, produced by the Crow Motor Car Company, Elkhart, Ind. The main garage is 80 by 27 feet, and it and the repair shop in the rear are of concrete construction and well lighted throughout. Two entrances, one at the front and the other at the rear, make the building particularly easy of access. H. A. Horton is manager, and aside from the cars represented, a full line of accessories and supplies is carried.

The Hood Auto Filling Station has been established at 119 Eighth avenue, Nashville, Tenn. The concern will carry a complete line of automobile oils, greases and gasoline.

The Barton Motor Car Company, Cedar Rapids, Ia., has been formed by L. M. Barton, who is president of the concern. The capital stock is $10,000 and the company will conduct a garage and repair shop, in addition to doing a wholesale and retail automobile business.

H. G. Martin, proprietor of the Oriental Rubber & Supply Company, 1170 Bedford avenue, Brooklyn, N. Y., has leased the building at 1166 Bedford avenue, corner of Madison street, and will locate his company there.

The Campell-Collins Company, San Jose, Cal., has opened a new automobile supply house at 241 South First street.

The Kendall Auto Company, Pasadena, Cal., has opened a new garage and salesroom on Broadway. The company is distributor for the Regal, Firestone-Columbus and Columbus electric lines.

Charles Day has taken over the garage on West Union street, Athens, O., and plans to make extensive additions to the present building.

The Buick Motor Car Company, Admiral boulevard, Kansas City, Mo., is to erect a large addition to its plant at an expenditure of $20,000.

Frank Waterhouse & Co., Inc., Seattle, Wash., has erected a large building at 1512 Broadway, which will be the headquarters in the Northwest for the Garford trucks and pleasure cars, made by the Garford Company, Elyria, O. P. E. Sands, for the past four years manager of the Seattle branch of the Studebaker Corporation, is in charge.

Charles H. Thompson, Los Angeles, Cal., has moved to his new garage on South Olive street, where he has facilities to extend the scope of his business.

The W. L. Nolan Company, Rochester, Minn., has taken possession of the garage of W. H. Brown and the building will be entirely remodelled.

George Middleton and C. C. Wilson have formed a partnership and have purchased the Algona Auto Garage at Emmetsburg, Ia., which they will conduct on an enlarged scale.

The Buckeye Garage has been opened on Monument avenue, Hamilton, O. John Leever will conduct a general motor car repair and supply shop business.

John Wenick, who owns the Mt. Diablo garage building on McDonald avenue, Richmond, Cal., is erecting an addition to the establishment, which is conducted by the Mt. Diablo Garage Company, Inc.

The Manley Hardware Company, Harvard, Wis., has had plans made for the erection of a substantial addition to its garage.

Jeremiah Coughlin & Son, Fort Dodge, Ia., has leased the Newberry livery stable, which will be converted into a modern garage.

The Hanover Garage, of which Andrew D. Baird is manager, is occupying its new, modern quarters, recently completed, at 20 Keap street, Brooklyn, N. Y.

Huestis & Knoche, Montgomery, N. Y., is establishing the Montgomery Garage & Machine Works and the Bull building is being remodelled for this purpose.

Daniel R. Schnabel, Johnstown, Penn., is to open a new automobile salesroom and repair shop on Main street, to be of modern construction.

Blackman & Follansbee, East Whitman, Mass., has built an addition to its garage to care for increasing business.

J. L. Bell and Ralph Wilson, Salt Lake City, Utah, have opened a garage on State street.

A. A. True and N. Levering, Highland, Cal., have purchased the Highland garage and will install a modern machine shop.

E. L. Clauss & Son has established a new fireproof garage at 6450 Selma avenue, Hollywood, Cal. It will be known as the Baker garage.

Arthur A. Bond has sold his interest in the Glasgow garage, Glasgow, Mo., to his partner, Charles J. Himmelberg, who in turn has disposed of a half interest to M. R. Cochran. The company will occupy space in the Fuller building.

Edward Dobschuts has moved into his new garage, the Eddie Motor Works, Pasadena, Cal., at Fair Oaks avenue and Center street.

L. C. Dale and O. G. Baker are occupying their recently completed garage on Stanton avenue, near Pacific electric station,, Stanton Cal.

Mrs. L. M. John, Inglewood, Cal., has purchased the rights, title and interest in the Inglewood garage of T. J. Myers and T. G. Stevens.

Laven & Halstrom, Mankato, Minn., has taken possession of its new repair shop and garage at 126 Washington street.

John Thompson of the Avon garage, Asbury Park, N. J., has taken a long lease of the McCabe building, Lake avenue, and opened a salesroom for the automobiles for which he is agent in that territory.

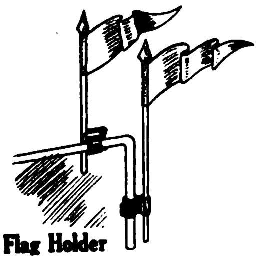
Taft's Queen's Plaza Auto Supply, Long Island City, L. I., in addition to its present location will establish other quarters at 65 Prospect street, for an annex garage. All modern appliances will be installed in the building. In addition to handling the Ford and Buick cars, the company carries a full line of tires, greases, oils and supplies.

The Turnbull Auto Company, Willimantic, Conn., has purchased property on Chestnut street and will remodel the building for a modern garage and general repair shop, with F. J. Wood in charge.

The Hartford Motor Car Company, Riverside, Cal., will establish a garage at Eighth and Hemon streets. The company handles the Buick cars, made by the Buick Motor Company, Flint, Mich., and a complete line of accessories. E. K. Hartford of San Diego, Cal., is manager.

Oliver Onsgard has retired from the firm of Onsgard & Foss, Caledonia, Minn., dealer in Ford cars, made by the Ford Motor Company, Detroit, and the business will be continued by his former partner, Edward Foss.

Universal Flag Holder.

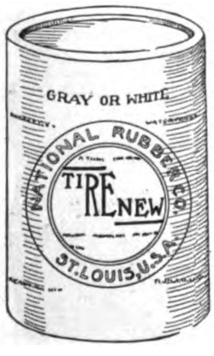


Universal Flag Holder

The Universal flag holder, made by the J. & J. Manufacturing Company, 192 Piquette avenue, Detroit, is a neat contrivance which supplies a pronounced demand felt by the automobile trade. The device appeals to touring motorists, as it is designed to fit on almost any part of a car, including guards, running board, windshield, etc., and will accommodate two pennants. It is small, neat and strong, and is constructed of a high grade spring steel, finely enamelled.

The flag holder is so simple that no adjustment is necessary and it can be placed on an automobile in a few seconds. It does not mar or deface the metal as the parts that come in contact with the machine are padded with rubber or felt. In the descriptive circular first sent out by the J. & J. Manufacturing Company the price for the windshield pennant holder was given as 50 cents, but this should have been stated as 25 cents. The price given for the fender holder as 75 cents was correct.

Narco and Tirenew.


GRAY OR WHITE
NATIONAL RUBBER CO.
TIRENEW
ST. LOUIS, U.S.A.

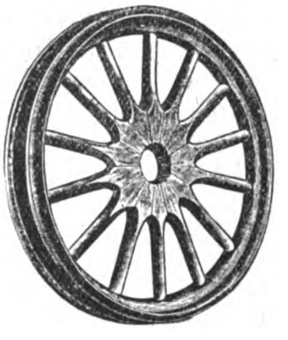
Tirenew

Narco tire cut filler is manufactured by the National Rubber Company, 4433 Narco building, St. Louis, Mo., and is a liquid, unvulcanized rubber compound which water proofs and protects the inner fabric from decay. By its use tire resistance to decay is said to be increased at least 30 per cent. and the tires are made to look like new. Cuts may be filled without the need for vulcanization, as the material heals completely over night. It is described briefly as a self-vulcanizing, combination rubber cement which has proved durable in service.

Another feature of the line made by this company is Tirenew, a coating for automobile, motorcycle and bicycle tires. The firm states that the base of the composition is pure Para rubber and being in liquid form is easily applied to the exterior of the shoe after the latter has been cleaned. The preparation not only preserves the rubber, but adds to the appearance of the tire. The company also is maker of Leaknot, a liquid, water proof rubber dressing, adaptable for coating leather, such as tops or upholstery. It is said to be colorless, odorless and not to injure the material, which it rubberizes. A quality emphasized is that it softens the leather.

Motor Car Wheels.

The Eberly & Orris Manufacturing Company, Mechanicsburg, Penn., specializes in wood wheels both for pleasure and commercial cars and is prepared to make to any specification and in any quantity as desired. The wheels are constructed of carefully selected bone-dry timber and the concern is equipped with the most modern machinery and facilities for this class of work. In addition the company makes a specialty of repairing both pleasure and commercial car wheels and will complete and return the work on the same day. A catalogue and price list will be mailed upon request.



Eberly & Orris Wheel

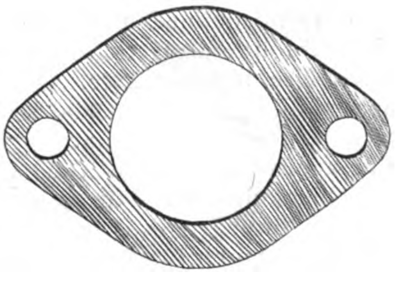
Vellumoid Gasket Stock.

Vellumoid gasket stock, sold through Charles D. Brown & Co., Inc., 49 Federal street, Boston, Mass., is a product, the process for which was patented in 1908. As the name suggests, it resembles genuine vellum, is extremely tough and is held to be impervious to animal, vegetable and mineral oils, as well as cold and luke warm water, brine, etc.

Vellumoid is used by the Knox Automobile Company, maker of Knox cars; American Locomotive Company, Alco cars; Port Huron Construction Company, automobile motors; Mast-Foos & Co., force pumps; F. E. Meyers & Bro., pumps; Clement, Restein Company, New York City, dealer in packing; Rix Compressed Air & Drill Company, San Francisco, compressed air engines; Wire & Craig Manufacturing Company, Chicago, engineer and machinist; Ira F. Wever, Portsmouth, N. H., agent for Ford cars, and a large number of others.

Heinze Spark Plugs.

The Heinze Electric Company, Detroit, and Lowell, Mass., is manufacturing a line of high grade spark plugs the non-sooting and non-fouling qualities of which are emphasized. The company has had an extended experience in ignition devices and the plugs are the result of many years of experimentation. The discounts to the jobber and dealer are very liberal, making the cost of these plugs very low and profits large.



Vellumoid Gasket

Cataract Tires and Tubes.

Producing a full line of tires and tubes for both pleasure and commercial cars, the Cataract Rubber Company, with main office in Boston, Mass., factory in Wooster, O., and branches in New York City, Buffalo, N. Y., Providence, R. I., and other cities, is presenting an extremely liberal proposition to prospective dealers. The tires are guaranteed for 4000 miles and the tubes are held to possess distinct advantages resulting in long life.

Pleasure car tires are produced with plain and break skid treads, the latter being on the vacuum principle, in either the quick detachable or clincher types, and in all sizes, both regular and oversize. The material is the finest grade of pure Para rubber, which is compounded to secure the highest degree of resistance to wear, strength, resilience and endurance. The fabric is the best quality of Sea Island cotton, woven with special reference to the use to be made of it. The tires are of the hand made wrapped tread type.

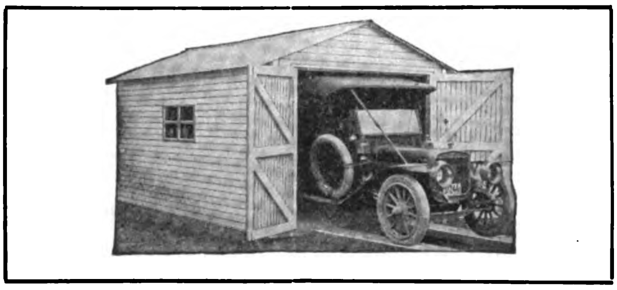
The truck tires are of the diagonal block type, and these are made for either single or dual service. The blocks are so constructed as to be removed quickly from the rim. Flanged on both sides and fitting snugly to the rim they are fastened by a cross sectional steel strip with three bolts inserted through the strip and the wheels, and tightened by nuts on the inside. Inasmuch as each section has a steel trellised base molded in the rubber and extending to the extreme of the flange it is maintained that all chance of base spreading is thereby effectually eliminated.

Two types of tubes are produced, the one being made from a high grade of Para rubber and known as the Selector, and the other being the Cataract gray tube. The former is extremely heavy, red in color and guaranteed for hard service, while the latter is of less expensive material, although it is claimed to be of unusual quality.

EDWARDS PORTABLE GARAGE.

Maker Has Attractive Proposition for Dealers Interested in Co-Operating in Meeting Demand.

Within the past few years there has arisen a demand for a neat, attractive garage which the owner may locate on a small plot of ground near his residence. The Edwards Manufacturing Company, 714-764 Eggleston avenue, Cincinnati, O., claims to be in a position to satisfy this demand with the Edwards private portable steel garage. Just now it is making an attractive offer to dealers, whereby the latter are invited to co-operate with this company in interesting the purchasers of new cars.



The Edwards Portable Garage, Fire, Water and Weather Proof, Easily Put Together and Constructed of High Grade Material.

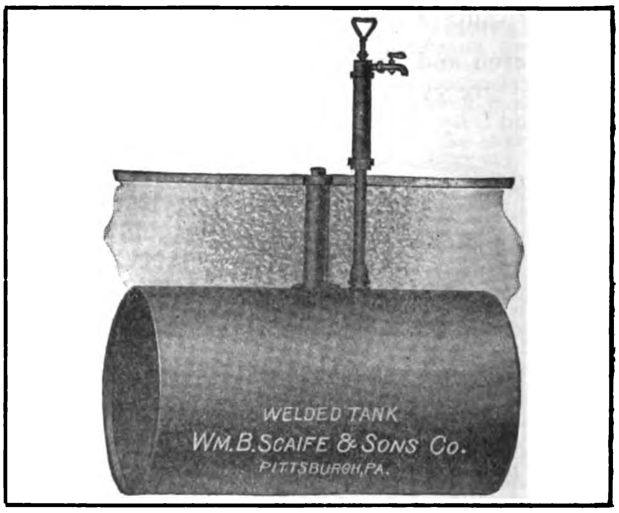
It is maintained that the Edwards garage gives absolute protection from sneak thieves, joy riders, fire, lightning, etc. It comes ready to set up and all parts are cut and fitted. Complete directions for assembling are furnished with each. The appearance is held to be artistic and attractive, blending well with the surroundings of the home. Ample room is provided for the car and sufficient equipment to care for it in an economical and efficient manner.

The material being of steel, it is held that the garage is practically indestructible. The exterior is so treated as to be rust proof, and all joints and seams are permanently tight. Provision is made for locking the doors and windows securely. The portable feature is one which will make its individual appeal. Complete details may be learned by addressing the company.

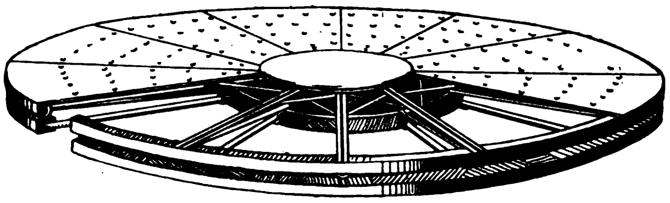
GASOLINE STORAGE OUTFITS.

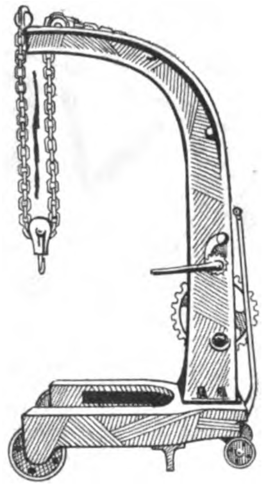
Scaife Line Will Assist Dealer in Marketing Fuel Without Waste.

With the constantly increasing price of motor fuel it is economy to equip the garage or service station with a high grade storage outfit and one that will prevent loss of the fluid through evaporation or handling. The William B. Scaife & Sons Company, Pittsburg, Penn., specializes in gasoline storage outfits and manufactures a large variety to meet individual requirements and installations. A feature of the storage tanks is their simplicity and durability. The company also makes welded, brazed and riveted tanks for the storing of gasoline, oil, water or air. Catalogues will be forwarded free upon request. The company also maintains a New York office at 26 Cortlandt street.



One of Several Gasoline Storage Outfits Manufactured by William B. Scaife & Sons Co.





For the Public and Private Garage
UP-TO-DATE

The most important question is that of handling your cars in the shortest time at least expense possible and with all chance of accidents done away with.

With the "UNIVERSAL" Automobile Turntable in your garage, you can drive both in and out "front end first"—no more backing out. Just run in on the Table, one little push making a half revolution, and your car is ready to start out.

These Tables are made in four sizes—one for every use—with capacity for supporting from the lightest runabout to the heaviest truck.

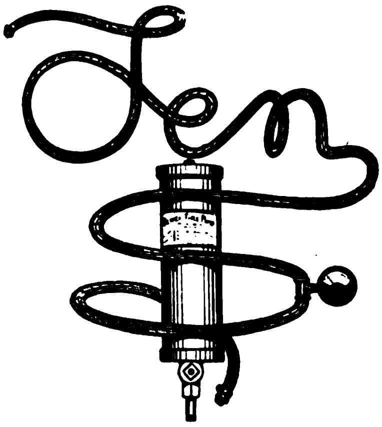
Better write today for full particulars, getting our Catalog "C-8."

The Indispensable "Handiest Tool in the Shop"

Does your lifting and tugging at one-fifth the expense you are now paying for this. No matter if you do have stationary chain hoists, you will find this "Handiest Tool" indispensable in your garage.

Write for our catalog "EE-7," and full information how to lessen cost.

The Canton Foundry & Machine Co.
CANTON, OHIO



The Pump for the User is the Pump for the Dealer
AND THAT IS
THE DEWEY POWER TIRE PUMP

Satisfaction guaranteed for one year. **Only $10.00** **It pumps pure air. Uses no oil.**

Is simple in construction and is furnished with twelve feet of highest grade air hose, Dial Pressure Gauge and all connections.

THE DEWEY-ANDERSON COMPANY, Toledo, Ohio

Tire Resistance To Decay

can be increased at least 30 per cent by the use of Tirenew and Narco Cut Filler.

TIRENEW TRADE MARK is a liquid, unvulcanized rubber compound---waterproofs and protects the inner fabric from decay.

Makes Tires Look Like New

Narco
TIRE CUT FILLER

a self-vulcanizing, combination rubber cement, cut filler and mastic. Fills cuts and puncture holes---heals over night---becomes like part of the tire. $1.00 a tube.

Dealers--Car Owners--Send $1.00 for a trial can of Tirenew---contains enough for 10 tires.

National Rubber Co., 4433 Narco Bldg., St. Louis, Mo.

"PASS THEM ALL"

Knox
BEST BY TEST
MOTOR CARS

Send for Pleasure or Commercial Catalogue.

KNOX AUTO CO., Springfield, Mass.

TRADE
VELLUMOID
MARK
Patented November 14 1905
GASKETS

Vellumoid resists gasoline, naphtha, kerosene and petroleum products, vegetable and animal greases and oils, cold and lukewarm water, brine, etc. Used in automobile construction for cylinder gaskets, crank-case cover gaskets, oil-pump body cover gaskets, water-pump inlet elbow gaskets, clutch cover gaskets, differential cover gaskets, and gaskets for oil, water and gasoline connections. Vellumoid is not recommended for hot steam under pressure.

Vellumoid is sold in rolls, 36 inches wide or cut into gaskets to pattern. We make it in five different thicknesses. Write us your requirements and let us quote you.

Vellumoid is stronger and more pliable wet than dry. Easy to work, satisfactory, durable. Vellumoid is used by the leading automobile manufacturers of the country.

TRADE
VELLUMOID
MARK
Pat. Nov. 14, 1905

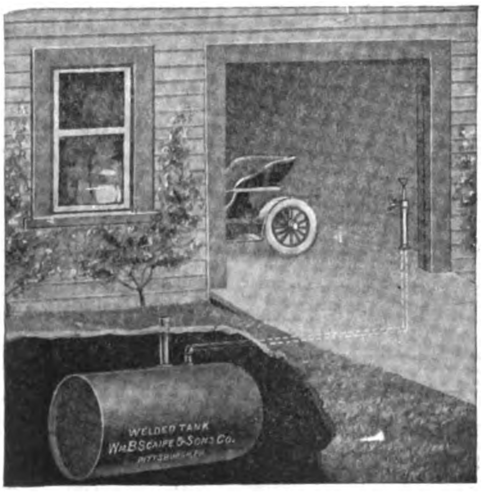
In order to introduce this stock we make this special offer on any quantity of Vellumoid amounting to 50 cents or over.

We will deliver by Parcel Post Prepaid to any point in the United States at the following prices.

Thickness	Price per sq. yd.
.033 ins.	$1.40 sq. yd.
.021 ins.	1.20 sq. yd.
.015 ins.	1.00 sq. yd.
.010 ins.	.80 sq. yd.
.006 ins.	.50 sq. yd.

Charles D. Brown Co., Inc.
Managers of Sales
49 FEDERAL STREET, BOSTON, MASS.

GASOLINE STORAGE OUTFITS


WELDED TANK
WM. B. SCAIFE & SONS CO.
PITTSBURGH, PA.

Note the simplicity of these outfits as compared with others.

We Also Manufacture

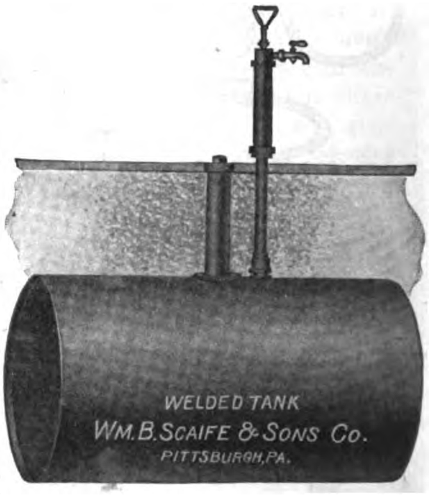
Welded, Riveted and Brazed

TANKS

For Gasoline, Oil, Air or Water

(Send for Catalogue)

Wm. B. Scaife & Sons Co.
PITTSBURGH, PA.
(New York Office, 26 Cortlandt St.)


WELDED TANK
WM. B. SCAIFE & SONS CO.
PITTSBURGH, PA.

MOTOR TRUCK
A MONTHLY MAGAZINE DEVOTED TO THE INTERESTS OF THE COMMERCIAL VEHICLE FIELD
Gives in Every Issue Information of the Highest Value Bearing Directly Upon the Various Factors Which Enter Into the Systematic Study of Transportation Methods.
ISSUED MONTHLY $1.00 THE YEAR
AUTOMOBILE JOURNAL PUBLISHING COMPANY
TIMES BUILDING, PAWTUCKET, R. I.

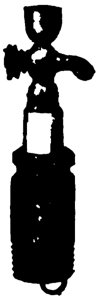
STOP CRANKING!

H. E. Co. Priming Spark Plugs

Makes Cranking of Motor Easy in the Coldest Weather

The simplest and most Scientific Priming Spark Plug yet devised.

Made of mica and guaranteed against leaking compression.



A set of one-half inch for ... $4.00

List Price $1.25

We have an interesting proposition which we are making to jobbers and dealers. *Write.*

HEINZE ELECTRIC COMPANY

LOWELL, MASS. **DETROIT, MICHIGAN**

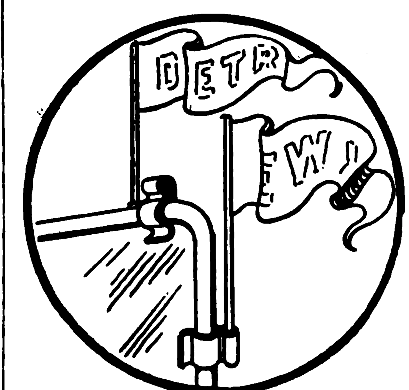
"THE EARLY BIRD CATCHES THE WORM!"

The Progressive Jobber and Dealer Catches the Dollars Which Slip by the Non-Progressive Man

We Offer to the Best House in Each Territory the Exclusive Sales Rights to

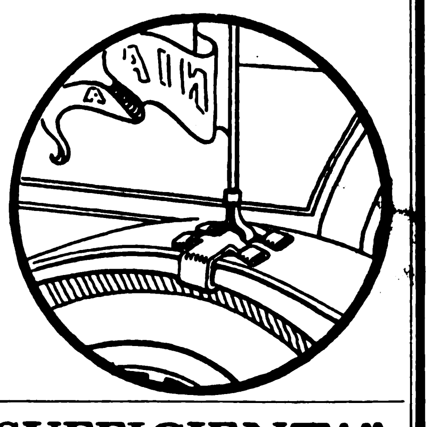
"The Universal Flag and Pennant Holder"

These Holders have absolutely no competition. Have numerous selling features such as: No tools required, attached in a moment, will not mar the finest finish, will hold the largest flag or pennant in the strongest wind. No screws to work loose or rattle. Neatly finished in black enamel.

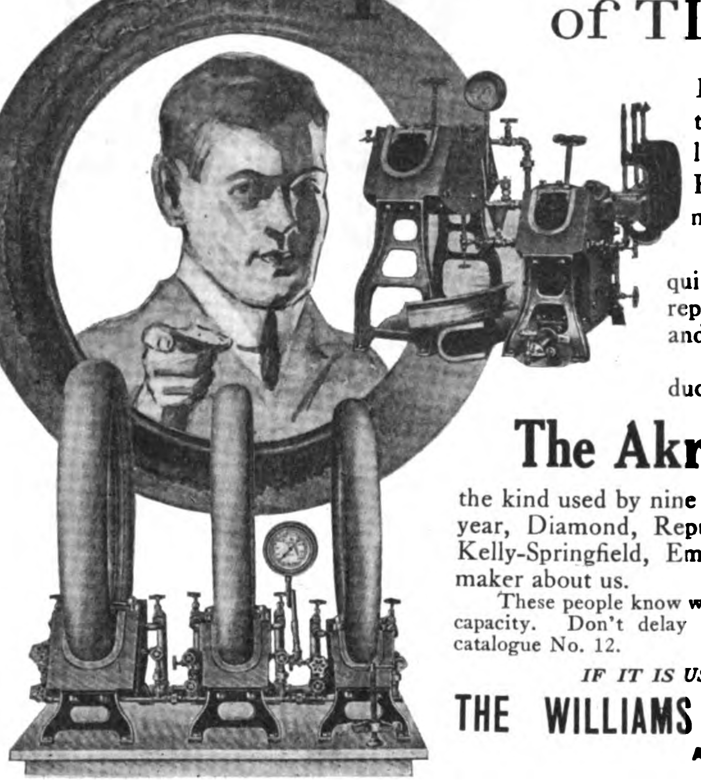


AN ORNAMENT TO
ANY CAR
Territory is Going Fast
Write today to

THE J. & J. MFG. CO.
192-4-6 Piquette Ave.,
DETROIT, MICH.
Department S.



"A WORD TO THE WISE IS SUFFICIENT!"



You ought to share in the profits of TIRE REPAIRING

Forty Million Dollars will be spent during 1913 for tire repairs. Every hundred cars will produce at least $3500.00 worth of this profitable business. Every motorist must have tires repaired. Every motorist in your vicinity is a possible customer.

There are large profits in tire repairing. Requires little capital to equip a shop with the best repairing outfit made. The equipment can be paid for and a good profit earned in a short time.

Get the right kind of equipment—one that produces work you can guarantee—

The Akron-Williams Equipment,

the kind used by nine out of ten such manufacturers as Firestone, Goodyear, Diamond, Republic, Shawmut, Walpole, Federal, Pennsylvania, Kelly-Springfield, Empire, Ajax-Grieb, Swinehart, etc. Ask your tire maker about us.

These people know what is practical. We can equip a repair plant of any desired capacity. Don't delay getting into this profitable business. Write today for catalogue No. 12.

IF IT IS USED TO REPAIR TIRES WE MAKE IT

THE WILLIAMS FOUNDRY & MACHINE COMPANY
ASH STREET, AKRON, OHIO

Send for Our Proposition

Satisfaction or money back guarantee, is the only basis on which they are sold.

Send for interesting charts showing saving of gasoline on basis of 20 cents a gallon.

If you sell one man He will sell all of his friends for you.

¶ A motor builder says Planhard Carburetors make new engines of old ones.

¶ The flexibility and control amazes new users. No springs, valves or cams. Absolutely automatic. Permanent adjustment.

¶ Show 10% to 25% saving in gasoline, tremendous power, increased speed.

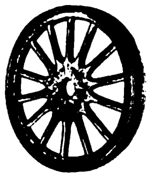
4300 miles without a miss on the "Dream".

A. N. Smith, Portland, Me., uses about one gallon less per hour on Hartford III. G. A. Schmidt, Lawrence, Mass., gets over 20 miles to a gallon on his automobile.

R. Webb Braham, Texas, "Two years without adjustment."—

Planhard Mfg. Co.
1790-2 Broadway, N. Y.

Pleasure Car & Motor Truck Wheels



Eberly & Orris Wheels Are Built of Carefully Selected Bone-Dry Timber, With High Class Facilities by Expert Mechanics.

Pleasure Car or Truck Equipment Made to Any Specification and in Any Quantity.

Can Supply Any Requirement. Catalog and Price List at request.

Auto and Truck Wheels Repaired and Returned Same Day

THE EBERLY & ORRIS MFG. CO.,
Mechanicsburg, Penna.

STOLEN AUTOS

Can be prevented with our
AUTOLOCK SWITCH

Put on Coil or Dash in ten minutes. Yale key for plug. One operation. Write for descriptive folder and price.

BLACKBURN SPECIALTY CO., 1132 Prospect Ave., Cleveland, O.

New Departure "TWO-IN-ONE" Ball Bearings

The only ball bearing that takes load from any direction with equal efficiency.

Catalog for the asking

THE NEW DEPARTURE MFG. CO.
Bristol, Connecticut

GARAGES MECHANICS REPAIR SHOPS

"ALLEN-FRICTION" SOCKET SETS

31 Sockets (Pressed Steel)
1 Universal Joint. 1 Screw Driver.
1 Short and 1 Long Extension

ALLEN WRENCH & TOOL CO.
PROVIDENCE R.I.

At Boston Show

"Allen-Friction"
IS NOT A RATCHET
Has NO TEETH SPRINGS

Instant Grip.
Works at any Angle.
Works in any Corner.

"Allen-Friction" Wrench is made of Solid Tool Steel, Drop Forged, Pack Hardened.

A HIGH-CLASS SET

Complete in Every Detail.
All Sockets Hardened.
All Parts Nickeled.

Set No. 31—Price $10.00

ALLEN WRENCH & TOOL CO., Providence, R. I., U. S. A.

For Smooth Running

HARRIS
LIGHT

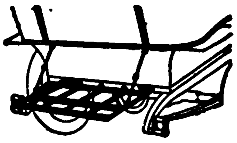
feed your engine
the best oils

HARRIS
TRADE MARK REG. U.S. PAT. OFF.
OILS

"A little goes a long way and every drop counts."

A. W. HARRIS OIL COMPANY

326 S. Water St., PROVIDENCE, R. I. 143 No. Wabash Ave., CHICAGO, ILL.



"STANDARD" TRUNK RACKS

Connecticut Steel and Wire Co., Hartford, Conn.

Can You Adjust and Time a Magneto?

If not,

THE A B C OF Magneto Ignition Systems

Will make principles of operation, construction, timing, adjusting, and locating trouble clear. A practical treatise for all who motor, written so that you can understand it. Over 30 illustrations and charts. Covers the subject thoroughly and concisely. Sent postpaid to any address in U. S. or Canada on receipt of 85 cents.

More Useful Information Than Ever Before Published on This Subject.

AUTOMOBILE JOURNAL
Times Building, Pawtucket, R. I.

SUBSCRIBE TO THE
AUTOMOBILE JOURNAL

$1.00 the Year **24 Issues**

Add $10 to $20 Profit to Each Automobile Sale

Here's an easy way to pick up an extra Ten or Twenty Dollar Bill whenever you sell an automobile.

Just send us the name of the purchaser and we will endeavor to sell him an Edwards Private Portable Steel Garage.

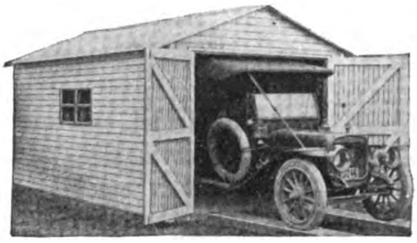
That's all we want you to do—**merely furnish us the name.**

You Invest No Money or Time

It means $9.25 to $20.00 profit **FOR YOU** on each sale. And you've no **money or time** invested. Send us a list of **all** automobile owners in your locality, and on this plan you'll make a nice, clean profit---perhaps several hundred dollars.

The Edwards is far and away the most popular and widely advertised Private Garage. Our prices are much lower than others'. And we've an excellent system of following up all names received. We won't miss any opportunities to close sales.

Write Us Now Send us your list of local auto owners at once, or we will be glad to answer any questions.



Edwards Fire-Proof Garage

An artistic, fire-proof steel structure for private use. Gives absolute protection from sneak thieves, joy riders, fire, lightning, accidents, carelessness, etc. Saves time, work, worry and trouble. Comes ready to set up. All parts cut and fitted. Simple, complete directions furnished. Absolutely rust-proof. Joints and seams permanently tight. Practically indestructible. Locks securely. Ample room for largest car and all equipment. Made by one of the largest makers of portable fire-proof buildings. Prompt, safe delivery and satisfaction guaranteed.

The Edwards Mfg. Co., 716-766 Eggleston Ave., Cincinnati, Ohio

USE NO ACIDS

"Simplex" Aluminum Solder

WILL DO ALL THIS FOR YOU:

It has the holding grip on all soft metals; is non-corrosive and is a good conductor of electricity. Will solder everything---aluminum to brass, copper, etc. We will give $100 for any aluminum casting brought to us we cannot solder. We solder with an ordinary iron, and what we do solder, "STICKS" because it is in OUR SOLDER.

30 Cents

will bring you a sample to prove it to you.

Special Inducements to the Trade.

Simplex Aluminum Solder Co., Inc.
108 Broadway, Long Island City, N. Y.
Tel. 988 Astoria.

Try the New Aluminum Solder. Ask for "Simplex."

"SIMPLEX" Solder has the stick.

ALL IN ONE
FRONTIER
ALL IN ONE

THE "ALL-IN-ONE" SPARK PLUG

All That the Name Implies

Prime your engine and clean your plugs at the same time.

Price $1.50 Each

Powerful
Sootless
Durable

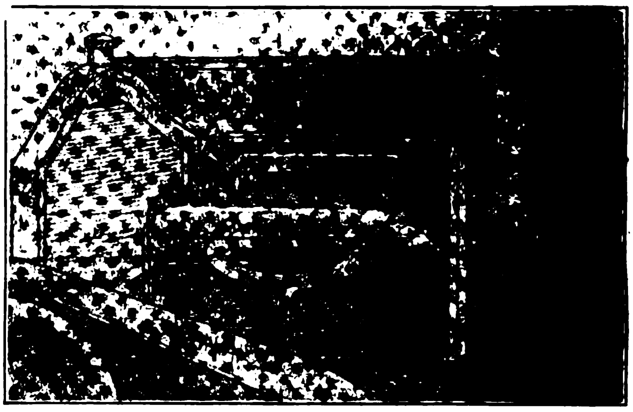
Designed and constructed for use with high or low tension magneto and battery ignition systems.

Made to fit any engine

We shall prosecute vigorously all infringements now on the market or any which may spring up in the future

FRONTIER SPECIALTY CO.
732 Main Street
BUFFALO - - - - - NEW YORK

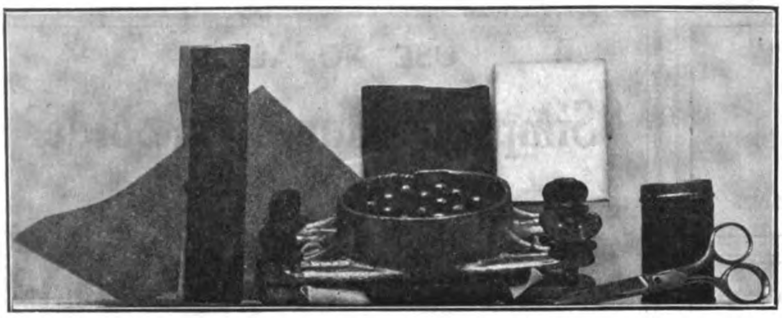
THE GILSON
Starter and Speeder



Efficiency and Economy

Guaranteed to save gasoline, give more power and speed, cut down carbon, and starts your motor on second turn in any temperature. For automobiles, motorcycles and all gasoline engines. Sold on merit, $10.00. Cannot get out of order. All users indorse it. Order direct or from your dealer.

Gilson Motor Starting Co.,
1407-1409 North Illinois St. INDIANAPOLIS, IND.



SOLE DISTRIBUTORS
ALLEN AUTO TIRE COMPANY
715 SEVENTH AVENUE NEW YORK CITY

Mr. Dealer HERE IS THE BRADY DANDY

The King of the Gasoline Vulcanizers

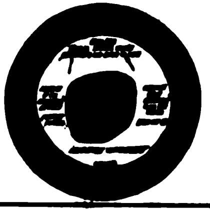
Larger, more positive on account of the four screws and quicker on account of its large curing base.

It cures a 4 1-4 inch patch on any size tube in 7 minutes. Weighs complete 3 1-2 lbs. Fits in any tool kit.

LISTS AT $3.50 WITH OUTFIT

Sold direct to Jobber, Dealer and Agent only. Prices are right and graded according to quantity.

A live representative wanted in every town and city. Write stating what you can do with it.



ABSOLUTE TIRE PROTECTION
GIVEN ONLY BY THE
Hopewell Tire Case

It prevents any water entering the spare tire (either from rain or hose used in washing). Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

Hopewell Brothers Newton, Mass.

GOOD AGENTS WANTED

To sell new invention for automobiles. Saves 1-3 gasoline. Don't delay. Write us at once for territory. We have salesmen making $50.00 per week. Natl. Mfg. Co., Kalamazoo, Mich.

PLANT FOR SALE; CHEAP—Suitable for Manufacturers of Automobile Bodies and Accessories. Equipped with Power, Lights and Sprinklers. Abundant Storage. The A. J. Phillips Co., Fenton, Mich.

WANTED—Boston firm, Manufacturers' Sales Agents, would like two or three more lines in New England. Wholesale only. Box Y, Automobile Journal Office, Pawtucket, R. I.

FOR SALE—Auto bodies, fore door, new, $60.00 to $95.00. Motors; Axles; Tires; Auto parts and accessories. Closing out factory stock. Independence Motors Co., Detroit, Mich.

FOR SALE—Attention of Truck Makers—We have on hand about 500 jack shafts for a 1000 to 1200-pound truck. These we will not be able to use owing to a change in design and to an interested party that can use these parts we will make a sacrifice price. Box 50, Accessory & Garage Journal.

CHAUFFEUR'S COMPLETE OUTFIT SACRIFICED—Consisting of elegant mink fur lined coat, Persian lamb collar $35, pair of elegant bear robes $15 each, Racoon Cap $5, pair of fur gloves $4, pair of goggles 50c, one pair leather leggins $3.50. Will sell separately or the lot, all new, never worn; original price $225. G. Chase, 118 East 28th St., New York.

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

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ACCESSORY MANUFACTURERS AND JOBBERS.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York.

Miller, Chas. E., 97-103 Reade St., New York.
Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree Street, Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

AUTOMOBILE SPECIALTIES.

Sumner George, Inc., 1841 Broadway, New York.

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

Marburg Bros., Inc., 1786 Broadway, New York. (S. R. O.)

New Departure Mfg. Co., Bristol, Conn. (New Departure.)

R. I. V. Co., 1771 Broadway, New York. (R. I. V.)

BATTERIES.

Geiszler Bros. Storage Battery Co., 514 W. 57th St., New York.

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (LBA.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind.; South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston; 287 Lafayette St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)

CARBURETION EXPERT.

Sumner, George, Inc., 1841 Broadway, New York.

CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

CARS—GASOLINE PLEASURE.

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Brush Runabout Co., 3 West 61st St., New York. (Brush Runabout, Liberty-Brush.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)

Croxton Motor Car Co., Washington, Penn. (Croxton.)

Cutting Motor Car Co., Jackson, Mich. (Cutting.)

Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.

Ideal Motor Car Co., Indianapolis. (Stutz.)

Imperial Automobile Co., Jackson, Mich. (Imperial.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.

Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1088 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (E-M-F and Flanders.)

United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)

Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Brush Runabout Co., 3 West 61st St., New York. (Brush.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clark, E. S., 242 Freeport St., Dorchester Dist., Boston. (Clark.)

Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.

Knox Automobile Co., Springfield, Mass. (Knox.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

United States Motor Co., 3 West 61st St., New York. (Sampson, Brush, Stoddard.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)

United States Motor Co., 3 West 61st St., New York. (Sampson.)

BUYERS' GUIDE---Continued

White Co., The, 828 E, 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 908 Boylston St., Boston. (Baldwin.)

Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.

Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

CONTROLLERS AND ECONOMIZERS.

Moller Brothers Controller & Economizer Co., 700 Betz Bldg., Philadelphia. (M. & M.)

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CUSHIONS.

Leavens & Co., Wm., 32 Canal St., Boston. (Leavens Shock Absorbing.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASKETS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vellumoid.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Automobile Supply Manufacturing Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston. (Jericho, Jubilee.)
Branch: 918 Eighth Ave., New York.

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

Morse, Frank W., 516 Atlantic Ave., Boston.

LICENSE NUMBER BRACKETS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)

Geissler Bros. Storage Battery Co., 514-520 W. 57th St., New York.

Remy Electric Co., Anderson, Ind. (Remy.)

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Haws, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Invader Oil Co., 80 Broad St., New York. (Invader.)
Branches: 284 Columbus Ave., Boston; 118 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Standard Oil Co., New York. (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.

Brets Co., J. S., 250 W. 54th St., New York. (U. & H.)

Marburg Bros., 1786 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; Mass. Ave. & St. Germain St., Boston; 430-36 Van Ness Ave., San Francisco; 868 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.; S. W. Cor. Cherry & Juniper Sts., Philadelphia; 1328 Grand Ave., Kansas City; Seattle, Wash.; London, Eng.; Buenos Ayres.

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

Emblem Manufacturing Co., Angola, N. Y. (Emblem.)
Branches: Los Angeles, San Francisco.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

Swenson, B. A., 522 Broad St., Cor. Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Rutenber Motor Co., Marion, Ind. (Rutenber.)

PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

POLISH.

International Metal Polish Co., Quill St. and Belt R. R., Indianapolis, Ind. (Blue Ribbon.)

PUBLICATIONS, AUTOMOBILE.

The Automobile Journal, 24 issues, $1.00 the year.

The Motor Truck (Commercial Car) Monthly, $1.00 the year.

The Accessory and Garage Journal, Monthly, $1.00 the year.

The A B C of Motor Car Operation	$.50
Overhauling, Rebuilding and Equipping the Motor Car	.50
The A B C of Aerial Navigation	.50
The A B C of Internal Combustion Engine Maintenance and Repair	.35
The A B C of Carburetor Construction, Maintenance and Repair	.35
The A B C of Magneto Systems	.35
The A B C of Battery Ignition Systems	.30
The A B C of Motor Car Chassis Maintenance and Repair	.25
Maintenance and Repair of Motor Car Tires	.25
Lighting the Motor Car by Electricity	.25

Send Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

PUMPS, OIL AND GREASE.

Randall-Faichney Co., Boston. (B-Line.)
Branches: See Horns.

PUMPS, TIRE.

Dewey-Anderson Co., Toledo, O. (Dewey Power.)

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (LBA.)
Branches: See Batteries.

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Eliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Heinze Electric Co., Lowell, Mass. (H. E. Co. Priming.)

Janney, Steinmetz & Co., Philadelphia.

Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)

Randall-Faichney Co., Boston. (Mac-Kae.)
Branches: See Horns.

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: See Magnetos and Magneto Supplies.

Standard Co., The, Torrington, Conn. (Black Eagle.)

SPARK PLUG TERMINALS.

Randall-Faichney Co., Boston. (Mac-Kae Blitz.)
Branches: See Horns.

SPEEDOMETERS.

Hoffecker Co., The, Motor Mart, Boston. (Hoffecker.)

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3928 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Marburg Bros., Inc., 1786 Broadway, New York. (Marburg-Hagen.)

Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

SPROCKETS.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)

STEEL PARTS, SEAMLESS.

Standard Welding Co., Cleveland.

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE ACCESSORIES.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

National Rubber Co., 4433 Papin St., St. Louis, Mo. (Tirenew.)

Page-Lester Co. 2644 Indiana Ave., Chicago. (Tite-Wad Rubber Putty.)

TIRES—CASINGS AND INNER TUBES.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Cataract Rubber Co., Wooster, O. (Cataract.)
Branches: Boston, New York, Providence.

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special Motz Cushion.)
Branches: Boston, New York, Philadelphia, Pittsburg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright. G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS—See Cars, Commercial.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TURNTABLES.

Beach Co., T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

Canton Foundry & Machine Co., Canton, O. (Universal.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 520 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VALVE GRINDERS.

Wall, J. H., 290 Hope St., Bristol, R. I. (Ford.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Williams Foundry & Machine Co., Akron, O.

WELDING OUTFITS.

Prest-O-Lite Co., 809 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WELDING, STEEL.

Standard Welding Co., Cleveland.

WHEELS.

Eberly & Orris Mfg. Co., Mechanicsburg, Penn.

WIRES AND CABLES.

Diamond Rubber Co., of N. Y., Akron, O. (Diamond.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

BLUE RIBBON POLISHES

SHINE LIKE THE SUN

THE LARGEST METAL POLISH FACTORY IN THE WORLD

A Record Breaker

Fastest and Brightest

Leads Everywhere

The World Over

BLUE RIBBON
TRADE MARK
CREAM
METAL POLISH
FOR CLEANING & POLISHING all METALS
FOR
SPEED
DURABILITY
BRILLIANCY

BLUE RIBBON
CREAM
METAL POLISH

Blue Ribbon Cream Metal Polish

It's a thick cream metal polish—an emulsion. The quickest and best for metals constantly exposed to the weather; best for inside work.

Does not settle; requires no shaking; leaves no sediment in crevices.

Only polish furnished in five or ten-gallon cans for garages, fire departments and other large users which gives perfect satisfaction.

It removes the TARNISH, not the METAL. A household necessity for cleaning and polishing all brass and metal trimmings and fixtures. Regarded by all large users and dealers everywhere as the ideal polish for all-around use and as a trade article.

Blue Ribbon Greaseless Cream Automobile Body Gloss and Furniture Polish

For body of any car. Keeps it like new. Maintains original gloss and finish. Revives and restores lustre adding new life to highly polished surfaces. Absolutely leaves no grease to catch dust. Also valuable for cleaning, preserving and brightening leather trimmings.

BLUE RIBBON
Greaseless Cream
AUTOMOBILE
BODY GLOSS
AND
FURNITURE POLISH

Manufactured By

International Metal Polish Company

QUILL STREET and BELT R. R.
INDIANAPOLIS, INDIANA

THE ACCESSORY AND GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., FEBRUARY, 1913. No. 10

STUDYING THE FUEL PROBLEM.

National Association of Automobile Manufacturers to Investigate Price Situation—Standard Oil Takes Action—International Body Will Offer Substantial Price in Effort to Reduce Prices—Other News.

The National Association of Automobile Manufacturers, composed of a large number of motor car makers, has decided to appoint a committee to confer with the Standard Oil Company on the question of fuel. Alfred Reeves has been selected as chairman, and will be assisted in this action by several of the most prominent men in the automobile industry.

That the increased cost of motor fuel has caused much apprehension among motorists generally is recognized by automobile makers. With this situation in view they appear to have taken action which is expected to result either in a reduction in price or adoption of a plan whereby a substitute may be placed in general use.

SEEKING NEW FUEL.

International Association Will Offer Substantial Prize in Effort to Lower Prices.

The International Association of Recognized Automobile Clubs, at its recent meeting in Paris, France, approved the proposal of Rene de Knyff to raise a prize fund of $100,000 for the best alternative fuel for use in existing internal combustion motors. The regulations have not been drawn up and will not be made public until the government of the interested countries will agree to impose no tax upon the fuel, or at least to admit it at a low fixed rate.

The action was taken because of serious alarm at the increasing cost of gasoline and a stipulation in connection with finding a substitute is that it must be available in large quantities and be of such nature that it cannot be controlled by trusts. The countries represented at the meeting were: France, Great Britain, America, Germany, Austria, Belgium, Denmark, Holland, Hungary, Italy, Russia, Switzerland, Sweden, Egypt, Roumania.

NEW MOTOR FUEL COMING.

Standard Oil Company Said to Be Prepared to Introduce Motor Spirit.

According to information from Chicago, the Standard Oil Company is prepared to market a new fuel for automobiles to be known as motor spirit. This is said to be a by-product of petroleum, with a gravity of 52-55 degrees, Baume, as compared with 58-60 for the present grades of gasoline. It is expected to sell for three cents a gallon less and to give 25 per cent. more mileage.

Motor spirit is said to have existed for some time, but with a color and odor which made it unsuitable for use. W. M. Burton is held to have perfected a process of refinement upon which patents only recently were granted. Experiments are said to have shown that a slight adjustment of the carburetor becomes necessary because of the need for more air.

ORGANIZE TO FIGHT BILL.

Massachusetts Truck Interests Take Decisive Action Against Weight Limitation.

Representatives of the motor truck and kindred industries, including users of mechanical transports, in Massachusetts, met in Boston early in the month to take decisive action on the bill now pending for the limitation of the weight of vehicles using the highways. It is generally conceded that the bill, which has the approval of the Massachusetts Highway Commission, is aimed at motor vehicles, the reason for the proposed legislation being that heavily loaded trucks damage bridges throughout the commonwealth.

The following committee was appointed to take up the fight in earnest: J. S. Hathaway, James T. Sullivan, J. B. Sullivan, Jr., James Fortesque, William H. Bain, John H. Duffell and J. Porter Russell.

MANAGES PREST-O-LITE BRANCH.

Well Known Boston Man Heads New England Organization in That City.

A. N. Dodge, who on Feb. 1 took charge of the Boston branch of the Prest-O-Lite Company, Indianapolis, Ind., is one of the best known men in the motor car industry in and around Boston. He first became identified with the business in March, 1907, connecting himself with Chester I. Campbell in the management of the Boston Automobile Dealers' Association shows. He continued in this position until September, 1908, when he resigned to become New England manager for the Truscott Boat Manufacturing Company.

In 1911 he resumed his work with Mr. Campbell, with whom he remained until he assumed charge of the Prest-O-Lite Company's Boston branch Feb. 1. Mr. Dodge's many friends in the industry in Boston and vicinity have given him their warmest congratulations, while hundreds of well known motorists have called at his office to wish him the best of success in his new venture. His experience has been such as to warrant the prediction that the business done by this branch will show a marked increase under his management.

Arthur N. Dodge, Manager, Prest-O-Lite Boston Branch.

MILLER ADOPTS PARCEL POST.

Pioneer Accessory Dealer First to Announce Free Delivery by This Method.

Chas. E. Miller, 97-103 Reade street, New York City, the pioneer accessory house in America, is the first to make announcement of the intention to utilize parcel post for making free delivery of the products handled anywhere in the United States. This is strictly in line with the Miller policy, and in effect places a Miller branch in every locality in the country.

In addition to the New York headquarters, which has built up a splendid business during the past 15 years, branch houses are located in New York City, Brooklyn, Buffalo and Albany, N. Y.; Boston and Springfield, Mass.; Hartford, Conn.; Philadelphia, Penn.; Newark, N. J.; Detroit, Mich.; Cleveland, O.; Atlanta, Ga., and New Orleans, La. The big Miller catalogue, which is free to anyone at request, places the individual motorist, no matter where located, in direct touch with any of these stores, and parcel post makes it possible to take advantage of New York prices or special quotations.

SPLITDORF'S FOREIGN POLICY.

Will Locate Branch and Service Station in London for European Users.

Another step in the Splitdorf policy to secure absolute service for users of its ignition devices was taken when O. J. Rohde, treasurer and general manager of the Splitdorf Electrical Company, Newark, N. J., sailed for Europe on the Kaiserin Augusta Victoria, taking with him a corps of experts on magnetos, coils and ignition in general. They will be established in London to attend to the wants of users of American cars.

Mr. Rohde has systematized the New York service station of the company to such a degree of perfection that his ideas will prevail in the working out of the details for the accommodation of Europeans and visitors alike. He will establish the service stations abroad with practical men in charge and when the system is thoroughly organized he will return to New York.

FORM CREDIT ASSOCIATION.

Omaha Jobbers and Dealers Organize to Further Their Mutual Interests.

A meeting of the jobbers of automobile supplies and the local representatives of tire factories was held in Omaha, Neb., during the recent show to perfect arrangements for forming a credit association and a constitution and bylaws were adopted. The name of the new organization will be the Automobile Supply Jobbers' Credit Association of Omaha.

This association was formed for the protection of its members in matters of credit and for the betterment of trade conditions in its territory. The following officers were elected: President, C. G. Powell; vice president, Arthur Storz; secretary and treasurer, L. C. Cohen. These three officers, together with T. V. Graves of the Goodyear Tire & Rubber Company, and F. H. Waldman of the Omaha Rubber Company, will conduct the affairs of the organization.

Death of President Cowham—Announcement is made by the Cutting Motor Car Company, Jackson, Mich., of the death in that city, Jan. 13, of William F. Cowham, president of the company. Mr. Cowham had been for a number of years a prominent figure in the automobile industry, and the loss to the Cutting company is one which will be felt personally by a large number of friends and acquaintances in all sections of the country.

REFEREE WILL HOLD SALE.

Property of the Niagara Lead & Battery Company to Be Offered at Auction.

Notice has been given to the creditors of the Niagara Lead & Battery Company, Niagara Falls, N. Y., which is now in bankruptcy, that the property will be offered for sale at auction Feb. 25. The property includes the brick factory and land, also engines, boilers, machinery and apparatus of all kinds within the factory, all of which is subject to a mortgage held by the Niagara Falls Power Company.

The sale will be made subject to the lien on said mortgage by the power company. All of the property will first be offered for sale by parcel and then by bulk and the bid which realizes the largest amount therefor will be accepted by the trustee. If a bid made in good faith and for cash, amounting to $3000, is received, the property will be struck off to the highest bidder, but if no bid is made subject to the encumbrances, such as liens and mortgage, the entire property will be offered free of all encumbrances, the lien of the mortgage to be attached to the funds realized and the validity of the lien then to be determined by the court. The sale will be made subject to the confirmation of the referee.

NEW BOSTON CORPORATION.

Ultra Motor Car Company, in Process of Organization, Tests Sample Car.

The Ultra Motor Car Company is a Boston corporation, not yet actively engaged in the manufacture of automobiles, but in the process of organization. Only one car has been built as yet, this being a sample machine which has been under test on the road for the past six months.

In a recent issue, the address of the concern was given as Amesbury, Mass., with a suggestion that it was soon to locate in Taunton. R. H. Randall, president and chief engineer, is authority for the statement that this information was incorrect. The other officers of the concern at present are: Vice president and treasurer, E. A. Bagg; clerk, C. A. Parker.

BRISCOE FRERES ORGANIZED.

Former Head of United States Motor Company Forms New Concern at Billancourt, France.

Benjamin Briscoe, formerly president of the United States Motor Company, has opened an automobile factory at Billancourt, France, the home of the Renault and in the heart of the French automobile manufacturing district. The company is registered under the name of Briscoe Freres.

It is understood that this factory is at work on the production of a new car to be placed on the American market in ample time for the 1914 season. It is claimed that the new machine will be a five-passenger vehicle to sell at less than $1000. When the car is completed it is said that it will be manufactured at Detroit and that an assembly plant will be erected in England for supplying the European market.

NEW R-C-H MANAGER.

Something About the Man Who Has Been Selected to Head Well Known Concern.

It was announced some few weeks since that Peyton R. Janney would soon become general manager of the R-C-H Corporation, Detroit, maker of R-C-H cars. The story of his rise from machinist's apprentice to his present position is one which has few counterparts outside of the automobile industry. In other words, Mr. Janney is one of those men to whom the title of self-made may be applied with much truth.

When he was 10 years of age he entered the agricultural implement business as a machinist's apprentice, and he worked his way to the position of superintendent when most boys are just beginning to think of their life work. His knowledge of automobile affairs has been gathered during 12 years of connection with the industry. Mr. Janney has been in every division of the trade, retail sales as well as factory sales and production. For two years before joining the R-C-H forces he was associated with the General Motors Company as manager of various truck and pleasure car companies subsidiary to that concern.

Peyton R. Janney, General Manager, R-C-H Corporation.

He is a big man physically, as well as in a business way, for standing over six feet tall, he weighs more than 220 pounds.

STUTZ CREATES NEW RECORDS.

Unofficial Figures Give Earl Cooper Marks for Seventy and Two Hundred Miles.

Earl Cooper in a Stutz car created new world's record for 75 and 200 miles on a circular mile dirt track at Fresno, Cal., Feb. 10. He failed to meet the 100-mile record by 1:23. Cooper's time for the 75 miles was 1:17:05 and for the 200 miles, 3:28:05.8.

These records are not official until passed upon by the contest board of the American Automobile Association. Each official that acted at the race must be sworn and a surveyor must take oath that the track is one mile in length. When this information reaches New York action will be taken by the A. A. A.

DETROIT BRANCH FACTORY.

Philadelphia Body Building Concern Locates Additional Plant in the Heart of the Industry.

The Edward G. Budd Manufacturing Company, Philadelphia, Penn., maker of automobile bodies, has decided to establish a branch factory in Detroit. The advantages of being in the heart of the automobile industry became apparent when an opportunity presented itself to purchase the buildings formerly occupied by the Grabowsky Power Wagon Company, which recently went into bankruptcy, and the Budd company has taken possession of this plant.

The property consists of 8.5 acres of land with buildings and the price paid was $110,000. The appraised valuation of the property is said to be $140,000. Contained in the purchase is a modern reinforced concrete building, four stories high, with 72,000 square feet of floor area, and a modern power building. There are also several sheds which the Grabowsky company utilized for storage purposes.

The Budd plant in Philadelphia will be operated to supply the trade in the East and south of Toledo, O., while the Detroit branch will handle the Michigan business and part of the West. By next May it is anticipated the production will total 30 completed bodies a day. The Edward G. Budd company was organized in June, 1912, with capital of $500,000 all paid in, and manufactures pressed steel bodies for commercial and pleasure cars.

JOINS LOZIER COMPANY.

Paul H. Smith Will Head Sales Department in Charge of Dealers and Agents.

President Harry M. Jewett of the Lozier Motor Company, Detroit, maker of Lozier cars, who has been building up his organization since he assumed the presidency of the company four months ago, has completed what he believes to be one of the most efficient executive forces in the industry. The latest addition to the Lozier staff is Paul Smith, who becomes sales manager with full charge of all branches, dealers and agents.

The association of Mr. Smith with the Lozier company will no doubt largely increase the distribution of Lozier cars. Four years ago he became assistant sales manager and for the past three years has headed the sales force of a company where he made an exceedingly strong reputation for doing business in a large way. During this time the production of this concern increased from 12,000 cars a year to 50,000. Mr. Smith has been identified with both high and medium priced machines and his knowledge of and personal acquaintance with over 4000 dealers will be of decided value to the Lozier company.

THE CHANDLER ORGANIZATION.

Additional Details Concerning Company Which Will Produce New Six-Cylinder Car.

Following the announcement of the Chandler six-cylinder car during the progress of the Chicago pleasure vehicle show, comes the information that the Chandler Motor Car Company is located temporarily at 982 Woodward avenue, Detroit, although it is not anticipated that the machine will be produced commercially in that city. The officials of the company are: President, F. C. Chandler; vice president and sales manager, Charles A. Emise; treasurer, Samuel Regar; secretary, M. S. Mead; designer, J. V. Whitbeck; superintendent, J. R. Hall.

It is learned that in August of last year Mr. Chandler resigned as general manager and Mr. Regar as treasurer of the Lozier Motor Company, Detroit. They employed Mr. Whitbeck, who severed his connection with the Lozier engineering department at the same time, to design the new car. The other officials of the Chandler concern tendered their resignation with the Lozier company about the same time, but continued in their connections until released. In the meantime work has been underway on the new model in a temporary shop and it was given its first road trials several weeks ago.

NEW STEEL CONCERN.

Pittsburg Men to Locate Plant to Produce Automobile Material in Canal Dover, O.

A new concern, capitalized at $1,200,000, to be known as the Dover Superior Steel Company, has closed negotiations to locate its plant at Canal Dover, O., and will employ 600 men. The promoters of the company are all well known and practical steel men of Pittsburg, Penn., including W. M. Parkin, H. T. Myer, Archie Smith and M. S. Young.

The firm is to manufacture steel bar for automobile chassis and steel furniture. The metal will be received at its plant direct from the Canal Dover furnace and in its molten state. Thirty-five acres of ground adjoining the furnaces have been secured for the erection of the plant.

A good idea of the magnitude of the automobile industry for 1913 can be obtained from the figures of the Splitdorf Electrical Company, Newark, N. J., maker of Splitdorf magnetos, and one of the oldest ignition houses in the country. The company has taken one order for 50,000 magnetos from the Willys-Overland Company, Toledo, O., while the orders from the Maxwell Motor Company, the Abbott Motor Company and the Chalmers Motor Car Company will total its production to 100,000 instruments.

OPENS DETROIT BRANCH.

Manufacturers' Traffic Department to Be Located in Ford Building.

Carrying out the plan recently inaugurated by the National Association of Automobile Manufacturers in an effort to assist the railroads of the country in supplying the industry with available freight cars, J. S. Marvin, the association's general traffic manager, has opened a branch office in Detroit.

The object is to keep the railroads closely advised concerning the movements of freight cars carrying automobile shipments from that centre and to assist them in making prompt return of the cars to the Detroit factories. The plan is expected to obviate many of the difficulties which presented themselves during the past season, as a result of which shipments to various sections of the country were considerably delayed.

Mr. Marvin has selected L. A. Gardner, formerly with the traffic department of the United States Motor Company, as manager of the new Detroit branch. His experience in this field is held to be such that there is every reason to believe that the new plan will meet with decided approval from the first.

NEW HENDERSON SIX.

Announcement Coincident with Resignation of C. S. Ricker as Chief Engineer.

Chester S. Ricker has resigned as chief engineer of the Henderson Motor Car Company, Indianapolis, Ind., maker of Henderson cars. In connection with the announcement is the interesting news that a new Henderson six-cylinder model will make its appearance in the near future, carrying a motor of special design, largely the handiwork of Mr. Ricker. Hitherto the Henderson company has manufactured only a four-cylinder car.

In commenting upon his proposed change Mr. Ricker explains that his connection with the Henderson company was largely due to his intimacy with the Henderson brothers, and the opportunity afforded to design a popular priced car embodying the features that in his judgment would represent the trend of the automobile trade. Mr. Ricker will continue as a stockholder of the firm and also remains a member of the board of engineers in an advisory capacity.

TO INCREASE ITS OUTPUT.

Lord Baltimore Truck Company Expected to Erect a Large Factory Building.

The Lord Baltimore Motor Car Company, Baltimore, Md., has announced its intention of greatly increasing its output of commercial vehicles during the present year. John Luntz, Jr., president and general manager of the concern, also is quoted as saying that the firm contemplates the immediate erection of a large factory to produce and market the number of cars it has contracted for.

For several years the Lord Baltimore company has been making commercial cars in a somewhat limited way. The officers of the company are: President, John Luntz, Jr.; vice president and treasurer, John Luntz, Sr.; secretary, J. Elmer Stryker; engineer and designer, Otto R. Bieler.

TWO NEW FIRESTONE MEN.

Bates Heads Pneumatic Tire Sales and Harris Joins Advertising Force.

The Firestone Tire & Rubber Company, Akron, O., announces the appointment of two new men to important places in its official family. George J. Bates has assumed charge of the sales in the pneumatic tire department and Roy C. Harris becomes assistant advertising manager. Both will reside in Akron.

Mr. Bates has a wide circle of friends in the industry, having been connected with the production and sale of tires for a long period. He goes to the Firestone company from the Diamond Rubber Company of Akron, with which concern he has been a department manager for the past five years.

George J. Bates, Sales Manager, Firestone Tire & Rubber Company.

Mr. Harris has been in charge of sales and publicity for the Vreeland Chemical Company of New York City for the past three years, and previous to that connection he was with the Crasselli Chemical Company of Cleveland, O. Although not quite as well known in the industry as Mr. Bates, Mr. Harris comes to his new duties with a thorough knowledge of advertising and business methods.

Twenty-nine governors have named delegates to represent their states in the second federal aid good roads convention called by the American Automobile Association to take place at Washington, D. C., March 6-7. Correspondence with the executives in the remaining states indicates that the representation may eventually cover the entire 48 commonwealths.

GARAGE ACCOUNTING SYSTEM.

Practical Method That Eliminates Waste and Provides Accurate Knowledge of Gross and Net Revenue and Expense in Four-Department Station.

THAT any business can be operated successfully without an adequate method of account keeping seems impossible, but it is a fact that many public service stations and garages have done so for several years. That their owners were able to show a profit is indication that dividends were possible despite slipshod methods. The proprietors in many cases realized that their business had grown from a small beginning to such proportions as necessitated additional investment to provide suitable buildings and equipment. They believed their plants possessed much greater earning power than was evidenced by their balance sheets, but to locate the shrinkage appeared almost a hopeless task.

The income of the plant was known to be much greater than at the start, yet the owner knew also that his profits were no more, if as great as in the days when the business was in its infancy. Clearly, something was wrong, but how to provide a remedy? System was found to be the only cure for this condition and consequently the task of selecting one applicable to the garage business proved to be imperative. Leaks must be stopped wherever found and a system sufficient to cover all phases of the business must be adopted.

The first requisite of a successful system is its simplicity, for an unwieldy and complicated set of books will more than likely lead to the hopeless entanglement of one making no pretensions to being an expert bookkeeper. Therefore, only systems at once simple and effective, which have been in use a sufficient length of time to recommend them, are sought. Many first class, practical garage mechanics have entered business for themselves and while they understand their line thoroughly, their knowledge of bookkeeping is of such indefinite proportions that the mere suggestion creates an impression of additional complications. However, it is possible to adopt a method of keeping accounts that will be simple and at the same time answer the purpose efficiently.

The system described herein has been utilized in a garage service of moderate proportions for some time and has proved its usefulness. In order to fix responsibility absolutely and keep an expense account of each department, this system was devised, after the business had been divided into four departments—sales, supplies, garage and repair.

Each department is apportioned its share of fixed charges, such as rent, interest, light, power, water, heat, advertising, office expense and salaries. This is based on the expense of the previous year, averaged for each month and each item. This permits comparison with any previous or corresponding month or with the average month. In the bookkeeping there is a ledger account for each department, in which is charged all the expense for each division. To the credit is placed all the earnings, the balance indicating the profit or loss. The sales for each day are posted to the credit of the department, but in the sales department the total cost and total sales are the principal items of record.

The stock is so arranged that attention is attracted to every department, and is grouped according to its make and size. Most of it is placed in locked compartments and on shelves and bins to prevent indiscriminate handling by the curious, to the detriment of the goods. The show cases are also closed in such manner that the stock carried on display cannot be reached except by those who have rightful access. Thus an undue depreciation of stock is prevented. System also prevents a shrinkage in the stock room.

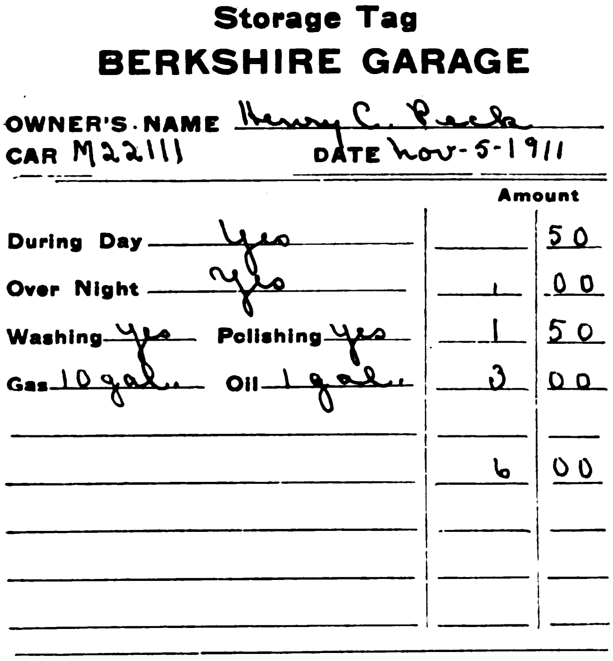
A summary is made each month which includes 13 totals of items, as illustrated in the accompanying blank, a glance at which is sufficient to indicate the expense, cost or revenue of any

	Cash Sales	Charge Sales	Total Sales	Cost	Net Receipts	Sales		Supplies		Garage		Repairs	
						Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Storage	$100	$150	$200	$50	$200					$250	$50		
Gasoline Sold	85	15	100	90	10					100	$90		
Oil Sold	25	10	35	25	10					35	25		
Tires Sold	250	50	300	200	100			$300	$200				
Labor	400	175	575	325	250							$575	$325
Battery Charging	25	10	35	20	15					35	20		
Parts Sold	80	20	100	65	35							100	65
Accessories Sold	250	70	320	195	125			320	195				
Cars Sold	7200		7200	5965	1235	$7200	$5965						
	$8,415	$500	$8915	$6,935	$1980	$7,200	$5965	$620	$395	$420	$185	$675	$390
Gross Earnings							1235		225		235		285
Payroll							100		40		100		75
Charges (Approximate)							350		80		65		130
Net Profit							$785		$105		$70		$80

Summary Sheet for Combination Agency and Garage, Showing Transactions of Each Department, with Cost, Gross and Net Receipts, the Fixed Charges and Net Profits of the Entire Business.

of the several departments. The first column is that of the cash revenue from storage of cars, labor, battery charging, and sale of gasoline, oil, tires, parts accessories and cars; the second, of charges made of similar transactions; the third, the total income from each source, which should equal the totals of the first two columns. The fourth column shows the expenditure charged against each item; the fifth, the difference between the receipts as shown in the third column and the expense as shown in the fourth. The third, fourth and fifth totals show gross and net revenue and expense. The sales, supplies, garage and repair departments are each shown in four additional columns by receipts and expenditures, as taken from the items of revenue in the first five columns, the footings giving the total receipts and expenses of each department. Thus a complete and separate account of the entire business is maintained which is a source of ready reference.

The sale of oil, gasoline, waste, carbide, grease and the like, and the storage, washing and polishing are sources of revenue in the garage, while the labor and the parts sold are credited to the repair department; the sale of tires and accessories to the supplies department, and the sale of cars to the sales department. The advantage of having each supply locked up, with the keys in charge of the foreman is at once apparent.



Storage Tag

BERKSHIRE GARAGE

OWNER'S NAME Henry C. Peck

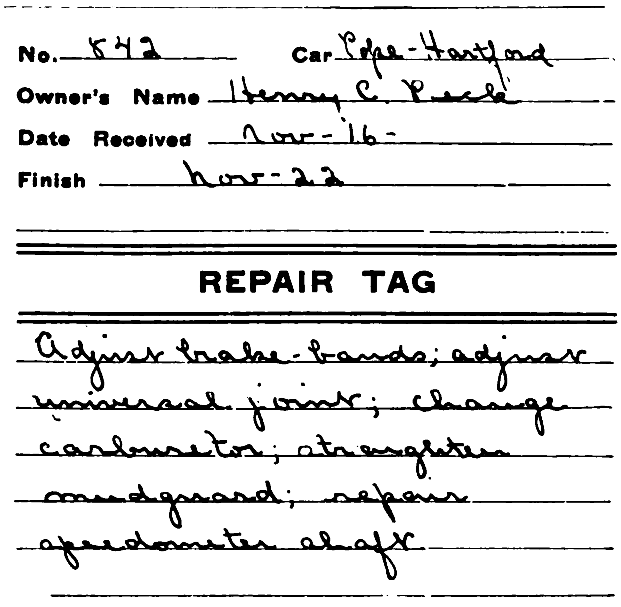
CAR M22111 DATE Nov-5-1911

		Amount
During Day Yes		50
Over Night Yes	1	00
Washing Yes Polishing Yes	1	50
Gas 10 gal. Oil 1 gal.	3	00
	6	00

Form 1, Storage Tag.

As in many garages it had been the custom for amateur mechanics to enter and work upon their own cars, using wrenches and other tools. At the conclusion of their work, if they returned the tools in as good condition as when they borrowed them, which was quite unlikely, they borrowed a small quantity of gasoline to cleanse their hands. This was freely given, but upon figuring that several such incidents occurred daily, a gallon of gasoline quickly disappeared in this manner for which there was no return. The garage was thus deprived of a certain revenue to which it was entitled.

With tools, oils and all materials under lock and key, this loose practise is stopped, and as the business of the garage is doing repair work of all kinds, the customer now is forced to appear at the office and state his needs. A man is assigned to the job and although it may be a simple one requiring a few minutes, the garage profits by a rightful nominal charge. If the job is of such nature that no charge is made, it still has gained by a saving of its tools in the hands of an experienced workman, and of gasoline which the customer would have used to clean his hands. The patron is quick to realize this and the fact that he is not charged unless the job is of sufficient magnitude is proof that he is being treated fairly.



No. 842 Car Pope-Hartford

Owner's Name Henry C. Peck

Date Received Nov-16-

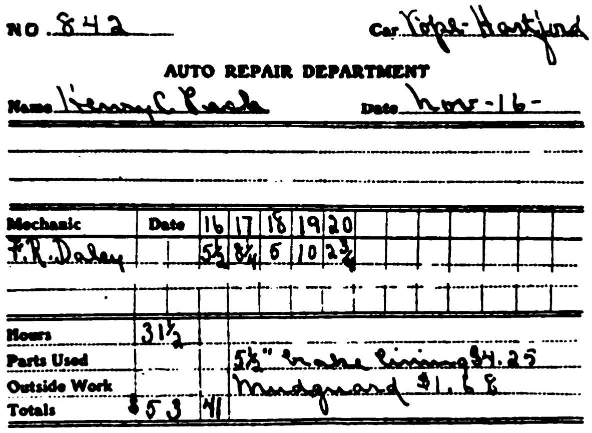
Finish Nov-22

REPAIR TAG

Adjust brake-bands; adjust universal joint; change carburetor; straighten mudguard; repair speedometer shaft.

Form 2, Repair Tag, Reverse of Storage Tag.

In the garage all sales are recorded by sales slips with carbon copies so as to indicate both cash and charge transactions. In the service records, in the event of a transient customer, the storage tag as shown at form 1 is filled out and attached to the car. This specifies the kind of service, with charges against each item, and a total is made. When the car is delivered the tag is re-



NO. 842 Car Pope-Hartford

AUTO REPAIR DEPARTMENT

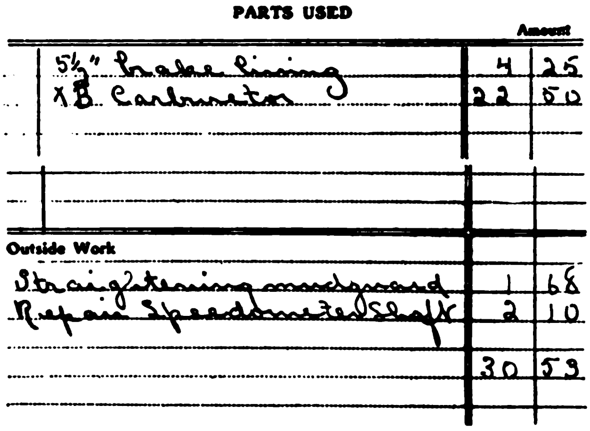
Name Henry C. Peck Date Nov-16-

Mechanic	Date	16	17	18	19	20							
F. R. Daley		5½	8¼	5	10	2¾							

Hours	31½		
Parts Used			5½" brake lining $4.25
Outside Work			Mudguard $1.68
Totals	$53	41	

Form 3, Foreman's Record Card.

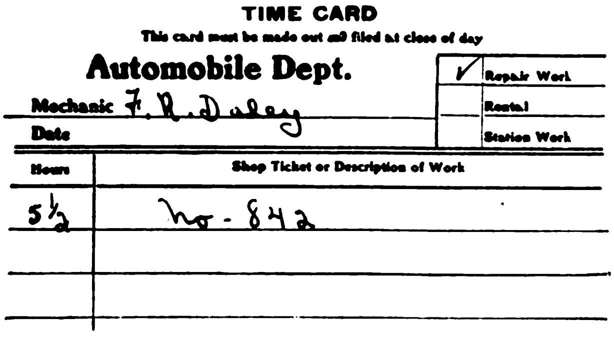
moved and a copy or receipt is given to the owner or driver. In case of repair, the reverse of the storage tag is filled in with necessary instruction. This tag is designated as form 2. When the car is received by the repair department a record is kept through the different stages of the work. This is on a form shown as 3. Upon it is noted the name of the mechanic, the dates and the number of hours of work each day. On the reverse of this form the record is continued under a summary which includes every component supplied from the stock room under "parts used," and "outside work," which defines whatever may not have been within the facilities of the garage shop. This is shown at form 4, and completes a record of the entire job which is returned to the office by the foreman with the notification that the car is ready for service.


PARTS USED

	Amount	
5½" brake lining	4	25
X B. Carburetor	22	50
Outside Work		
Straightening mudguard	1	68
Repair Speedometer Shaft	2	10
	30	53

Form 4, Reverse of Form 3.

The owners of cars stored in the garage are required to keep their property in lockers, so that no responsibility for private property is incurred. Responsibility is imperative for the garage business and the cars of transients are kept under lock and key, so that access cannot be gained even by the owner or driver without the knowledge of the garage management. It cannot be too strongly emphasized that care should be exercised in the selection of employees. Good wages should be paid, thereby insuring a class of workmen who will value their employment. There will be less possibility of visitations by their friends, who may be attracted by unprotected property of the establishment.


TIME CARD

This card must be made out and filed at close of day

Automobile Dept.

☑ Repair Work
☐ Rental
☐ Station Work

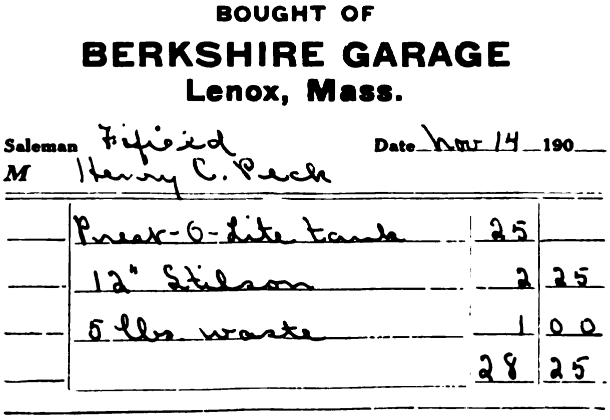
Mechanic F. R. Daley

Date

Hours	Shop Ticket or Description of Work
5½	No - 842

Form 5, Time Card for Workmen.

In the matter of keeping the time of the workmen each man keeps an account of his time under the direction of the foreman and the cards are each day collected and sent to the office. They are grouped with reference to each job of work and they must coincide with the records of the foreman. The time card is shown as form 5. The repair blank is a bill in itself, from which the outgoing bill is made up and passed upon before being sent to the customer. If the account is paid immediately it is recorded by a sales slip, a copy of which is given as a voucher with the receipted bill, there being two records for the customer and the office instead of one. The sales slip is shown as form 6.


BOUGHT OF

BERKSHIRE GARAGE

Lenox, Mass.

Saleman Fifield Date Nov 14 190

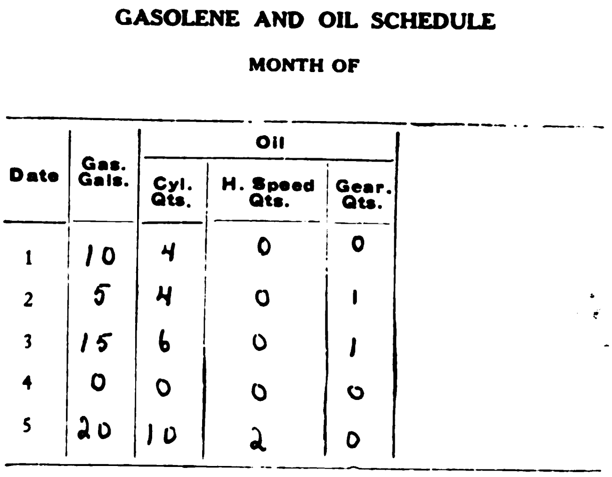
M Henry C. Peck

Prest-O-Lite tank	25	
12" Stilson	2	25
5 lbs. waste	1	00
	28	25

Form 6, Sales Slip.

A gasoline and oil schedule with account for every day of the month is made out for every car in live storage and entry is made whenever the tanks are filled. This is original and is kept on file, being a check against sales. A copy is sent to the owner of the car for verification of the items entered on the bill. This shows gasoline in gallons, cylinder, high speed and gearcase oil in quarts, with incidentals and total value. From these slips the charges are made monthly. This slip is shown as form 7.

A feature of the business is found in the fact that the stock is carefully kept and wherever possible stock is tagged and when a sale is made these tags are turned into the cash register. This gives information which permits of frequent ordering and the maintenance of stock to the required volume.


GASOLENE AND OIL SCHEDULE

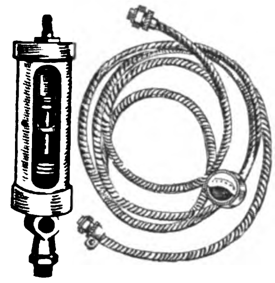
MONTH OF

Date	Gas. Gals.	Oil		
		Cyl. Qts.	H. Speed Qts.	Gear. Qts.
1	10	4	0	0
2	5	4	0	1
3	15	6	0	1
4	0	0	0	0
5	20	10	2	0

Form 7, Gasoline and Oil Record, Boarders' Cars.

Dewey Power Tire Pump.

The Dewey power tire pump, which is made by the Dewey-Anderson Company, Toledo, O., is actuated by the energy of the motor and is inserted in the spark plug opening. The pump itself is constructed of brass and is designed so that fresh air is taken into a special chamber from the outside and then forced to the tire through 12 feet of rubber hose.



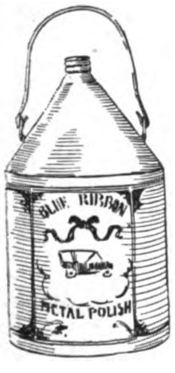
Dewey Tire Pump

The hose is equipped with self-opening connections and is fitted with adapters for any car. A pressure gauge is supplied for determining the desired number of pounds. This pump has given splendid satisfaction and is extensively used. The company will mail full descriptive matter on request.

★

Blue Ribbon Metal Polish.

The International Metal Polish Company, Quill street and Belt railroad, Indianapolis, Ind., manufactures the Blue Ribbon cream metal polish which has, among its other excellent qualities, the ability to remove quickly and easily all tarnish from metal. It is held to be especially adapted for inside metal trimmings and not to soil fabric. This polish does not require any shaking, the ingredients being carefully blended and in the form of an emulsion. It is commonly put up in five and 10-gallon cans for garage and service stations.



Blue Ribbon Metal Polish

In addition, the company produces the Blue Ribbon greaseless cream, an automobile and furniture body gloss and polish. By its use the lustre and gloss of the paint are restored and in addition to leaving a highly polished surface, it does not attract the dust. It is also adaptable for cleaning, preserving and brightening leather trimmings. Catalogues will be mailed on request.

★

The Texas Company.

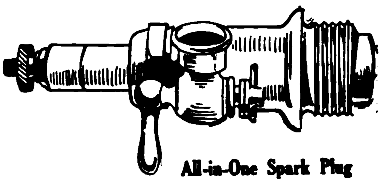
Texaco is an oil made by the Texas Oil Company, New York City, and is guaranteed not to congeal at any temperature down to zero. The Texas company has large oil fields in many parts of the country and its line is complete in every respect. The Texaco engine oils are held to be remarkably free of carbon, thus eliminating all depositing features, and are refined to obtain perfect combustion in engine cylinders at high temperature and also to remain fluid in zero weather. Owing to the special filtration methods it is maintained that the oil will burn up cleanly after performing its legitimate function.

★

All-in-One Spark Plug.

Aside from the installation of a compression relief and priming cock at the top of the shell, the All-in-One spark plug, made by the Frontier Specialty Company, Buffalo, N. Y., is of conventional design. The plugs are of differing shapes and lengths to permit of the installation in motors of various types, whether conventional, horizontal or with recessed plugs.

These are especially adapted for engines which are not equipped with compression release cocks, either for automobile or marine purposes. By priming the motor at the spark plugs starting is facilitated under any circumstances, while cleaning the electrodes, etc., may be accomplished without difficulty by use of gasoline. Kerosene may also be used for freeing the rings, piston, etc., of carbon deposits.



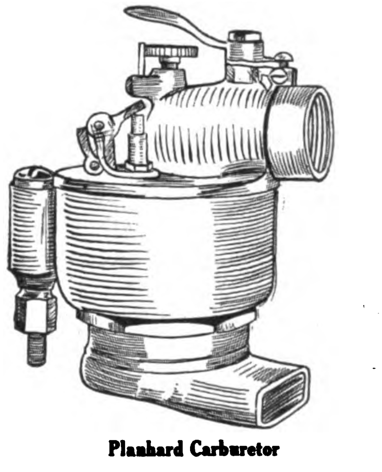
All-in-One Spark Plug

★

Planhard Carburetor.

Planhard carburetors are the product of the Planhard Manufacturing Company, Kokomo, Ind., which has its general sales offices at Philadelphia. These carburetors make for simplicity, as they have no springs and but one spraying nozzle, which is located in the centre of a cup shaped member and surrounded by a constant air opening.

Air is admitted through this opening at low and intermediate speeds, but at the increase of speed of the piston, its suction lifts one or more balls in a plate surrounding the fixed air passages, increasing the amount of air admitted. This plate is adjustable and is fitted with six balls. A concentric float is utilized, enclosing the upper fixed air passage. This is equipped with a priming device and controlled in the usual manner. The needle valve proper is adjusted underneath and locked by a wing nut. It is claimed that with the Planhard carburetor a perfect mixture is obtainable and that economy of fuel is secured. Dealers are invited to write for descriptive matter and price list.



Planhard Carburetor

REGISTRATION INDICATES A MILLION CARS.

WHILE it is impossible to secure complete figures regarding the registration of automobiles and motorcycles in all of the 48 states of the Union, as some commonwealths have no registration law and the licensing of cars in others is by local ordinance or with county officials, statistics from 37 states and the District of Columbia show that there were listed 970,327 vehicles at the close of 1912. It will be admitted that in certain instances these figures will include some duplication of cars, but when the number of machines in use in the other 11 states is taken into consideration, this will be more than offset. The conclusion must be that there are now in use in the United States more than 1,000,000 motor vehicles.

Photo Copyrighted, Underwood & Underwood, New York.

Motor Traffic on Fifth Avenue, New York City.

The information contained in accompanying table was secured by the Accessory and Garage Journal from state officials, with two exceptions. In one instance the figures are the statement made by the manager of a leading commercial body in a state which does not require registration by law. The classification is as it appears on the books of the state officials, and it will be noted that in some instances this is with all types of vehicles in one list, while in others there has been distinct attempt to keep a separate listing.

It will be seen that there are no entries for the states of Arizona, Colorado, Florida, Idaho, Kansas, Louisiana, Nevada, Oklahoma, South Carolina, Texas or Wyoming. The District of Alaska and the Insular possessions also are omitted. Local ordinances exist in Colorado, Louisiana and Wyoming, but only in a few cities. In Texas registration is with the county clerks and in South Carolina with the clerks of the county courts. There are no registration laws in the other states named, save Florida and Oklahoma, from which no returns were received. The figures for Montana are those supplied by the manager of the Commercial Club of Helena, and are regarded as conservative.

While it is true that some machines have been registered in two states, these comprise a comparatively small percentage. Taking Massachusetts as an example, there were 881 licenses issued to non-residents in 1912, or about 1.51 per cent. It may be stated that this number is not included in the accompanying tabulation for that state, but if the same ratio were to hold throughout the country the total result would not be affected materially.

There is one other point which must be taken into consideration. In some states perpetual registration is still in vogue, while in others the life of a registration is three years instead of one. It would be impossible to arrive at an exact determination of the cars in use in these commonwealths without analysis of each state law. There seems little doubt, however, that when allowance is made for all duplications, the number in serv-

OFFICIAL REGISTRATION FIGURES.

State	Pleasure Cars	Service Wagons	Motor-cycles	Motor Vehicles Un-classified	Total Vehicle Regis-tration
Alabama	3,010	130	220	....	3,360
Arkansas	....	....	....	2,000	2,000
California	....	....	....	88,867	88,867
Connecticut	....	....	2,525	17,875	20,400
Delaware	....	....	....	1,732	1,732
Georgia	....	....	....	18,100	18,100
Illinois	....	....	9,236	67,913	77,149
Indiana	....	....	....	65,000	65,000
Iowa	....	....	4,209	44,141	48,350
Kentucky	....	....	....	5,284	5,284
Maine	7,880	265	358	....	8,503
Massachusetts	46,096	4,036	5,034	....	55,166
Maryland	9,710	733	1,859	....	12,302
Michigan	....	....	3,620	39,569	43,189
Mississippi	....	25	....	2,855	2,880
Missouri	22,087	1,301	973	....	24,361
Montana	300	100	47	....	447
New Jersey	....	....	6,171	42,852	49,023
Nebraska	....	....	....	33,921	33,921
New York	95,319	9,649	....	....	104,968
North Dakota	....	....	470	9,470	9,940
Ohio	....	....	....	63,125	63,125
Oregon	8,284	695	1,183	....	10,162
Pennsylvania	....	....	7,314	59,334	66,648
Rhode Island	7,518	745	780	....	9,043
South Dakota	....	....	750	15,200	15,950
Tennessee	....	....	....	9,993	9,993
Washington	....	....	....	13,000	13,000
West Virginia	....	....	....	3,090	3,090
Wisconsin	....	....	4,060	24,578	28,638
Virginia	....	....	714	5,760	6,474
Vermont	....	....	204	4,381	4,585
North Carolina	....	....	....	6,200	6,200
New Hampshire	....	....	590	6,710	7,300
Minnesota	....	....	4,000	29,000	33,000
New Mexico	....	....	....	886	886
Dist. Columbia	....	....	2,393	12,346	14,739
Utah	....	....	....	2,552	2,552
Total	200,204	17,679	56,710	695,734	970,327

ice in the 11 states not included in the tabulation will not be equalled. The conclusion that there are at present 1,000,000 motor vehicles in use in the United States must be regarded as conservative. Incidentally, the figures presented offer opportunity of possibilities for future business.

MERCER'S YEAR BOOK.

Work of Beck Engraving Company Reflects Characteristics of New Series.

Among the many very pleasing catalogues calling attention to the products of various manufacturers in the automobile industry, the year book issued by the Mercer Automobile Company, Trenton, N. J., is particularly appropriate. It is the product of the Beck Engraving Company and the illustrations and typographical work are worthy of special mention.

The reputation gained by Mercer cars in road and track contests during 1912 is reflected in both text and illustrations, scenes depicting some of the most notable events in which Mercers contended with honor being reproduced. The main portion of the book is devoted to a detailed description of the new series with photographs of the cars in settings bringing out their features in a pleasing manner. The various components of the chassis are similarly treated.

NEW TIRE CONCERN.

Capitalized for $250,000 and Will Erect Factory in Louisville, Ky.

A new concern, to be known as the Speedway Tire Company and composed of business men in Louisville, Ky., Atlanta, Ga., and other cities, is to establish a factory at Louisville for the manufacture of pneumatic and solid tires for motor vehicles of all types. A repair department will be one of the features of the plant. The capitalization of the new company is announced to be $250,000.

Harry L. Lewman, president of the Lewman-Cox Realty Company and chairman of the board of directors of the Falls City Construction Company of Louisville, has been elected president of the new concern, while L. D. Lewman of Atlanta, president of the Manhattan Construction Company of New York City, is first vice president. Other officers are: Second vice president is Fred Haupt of Louisville; treasurer, W. N. Cox, president of the Louisville Public Warehouse Company; secretary, Dr. Fred L. Koontz.

G. W. Greens, one of the most experienced rubber men in the country, who has been in charge of a large plant in the East, has been engaged as manager and has begun his active work, orders having been placed for the necessary machinery to begin operations. As soon as a site can be selected the company intends to build its own plant. About 200 men will be employed at first.

LION PROPERTY SOLD.

Chicago Concern Files Bid Which Proves Acceptable After Week's Delay.

According to advices from Adrian, Mich., the property of the Lion Motor Car Company of that city, which met with reverses shortly after the destruction of its plant by fire early last year, has been sold to Samuel Winternitz & Co., Chicago, for $13,000. The appraised value is understood to have been $33,000..

The bids were opened by Lee E. Joslyn, referee in bankruptcy, the largest being $7000, and the sale was postponed one week, in view of the discrepancy between the highest bid and the appraised valuation. In the meantime the Strong, Carlisle & Hammond Company of Cleveland, O., entered the lists, with the result that the price was advanced to $13,000.

EMPIRE TIRE REORGANIZATION.

Two Older Concerns Combine with Increased Capital and Facilities for Production.

The Empire Tire Company and the Empire Rubber Manufacturing Company, both of Trenton, N. J., and controlled practically by the same individuals, have been combined under a new organization to be known as the Empire Tire & Rubber Company. The capitalization of the new concern is $1,000,000, of which $500,000 is preferred stock and the other half common. This represents an increase of $450,000 over the capitalization of the former companies.

There has been no material change in the official personnel of the concern. C. Edward Murphy will continue to direct the affairs as treasurer and general manager. The other officers are: President, Charles H. Baker; vice president, J. Cornell Murray; secretary, A. Boyd Cornell.

TO MANUFACTURE BODIES.

Los Angeles Concern Increases Facilities to Meet Additional Demand for Product.

The Kribs Auto Works, Los Angeles, Cal., has just installed several of the largest and most modern machines used in building automobile bodies and this department has been put in charge of a corps of experts. The company is now established in its new place of business on 10th street and is prepared to handle all kinds of automobile work.

The heaviest demand recently has been for painting and the building of fore doors on old models. A large number of orders are also being received for truck and delivery car bodies. Many of the trucks sold in Los Angeles and vicinity are without bodies, the merchants preferring to have special designs built to order, a practise which has resulted in increased business for the Kribs Auto Works.

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-AND-
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Entered as second class matter Dec. 30, 1911, at the post-office at Pawtucket, R. I., under the Act of March 3, 1879.

PRICE OF GASOLINE.

The price of gasoline has advanced from 50 to 80 per cent. since about the first of the year and there does not appear to be any immediate suggestion that this fuel will be produced in such quantity as to warrant a reduction in cost. Contrary to popular belief, the difficulty does not rest with the refineries, which are found to be totally incapable of supplying at a reasonable figure the enormous demand created during the past few years by the immense growth of the automobile industry. There appears, however, to be no satisfactory solution of the problem save the adoption of a suitable substitute for gasoline.

Logically, this should be kerosene, which is less costly and more plentiful. It is more or less well known that engineers have been at work along this line for the past year, at least, but probably the reason the kerosene carburetor has not been introduced is because the public has been very well satisfied with gasoline. With the continued rise in price, however, this satisfaction promises to be short lived and an insistent demand for a substitute fuel may soon be expected to call forth an efficient kerosene carburetor.

TIRE MILEAGE GUARANTEES.

The action of the tire section of the Motor & Accessory Manufacturers in adopting a new form of tire guarantee in which the stipulated mileage feature was eliminated, has occasioned much discussion among producers, dealers and users. There has been some disposition to feel that the step was decidedly radical, and no doubt dealers will be called upon to interpret its effect upon the product handled by them.

The consensus of opinion among manufacturers appears to be that each company is left free to make adjustments upon such basis as it sees fit. It seems logical that every effort will be made to protect the dealer and user, as heretofore, but the very apparent desire is to enable the producer to protect himself against what he believes to have been a questionable practise on the part of certain interests.

NATIONAL VS. LOCAL SHOWS.

Shortly after the close of the recent New York show, President Albert L. Pope of the Pope Manufacturing Company, Hartford, Conn., addressed a letter to the various car manufacturers throughout the country suggesting the advisability of abandoning the national shows in New York and Chicago. The resulting discussion has resolved itself into a question of the relative merits of the national and the local display.

Many makers appear to favor a proposition involving the support of local dealers in holding annual shows in the various centres throughout the country, instead of concentrating time, effort and money upon a national display in one or two of the largest cities. The question becomes one of reaching the largest number of prospective purchasers and in the most advantageous manner. It is pointed out that the Boston show, which always has been a dealers' display, is the largest and best business exhibition of the year. There seems to be no reason why similar results could not be secured under like conditions in New York and Chicago, for example. The problem is being given serious consideration and the resulting decision will be based entirely upon the best interests of the industry as a whole.

To foster trade and correct alleged abuses the garage owners of Brooklyn, N. Y., have incorporated a board of trade. Organized co-operation seems to be necessary, for although the maintenance of public garages is of comparatively recent origin, it has developed into immense proportions and attracted men of standing, who have too frequently been the victims of unfair measures.

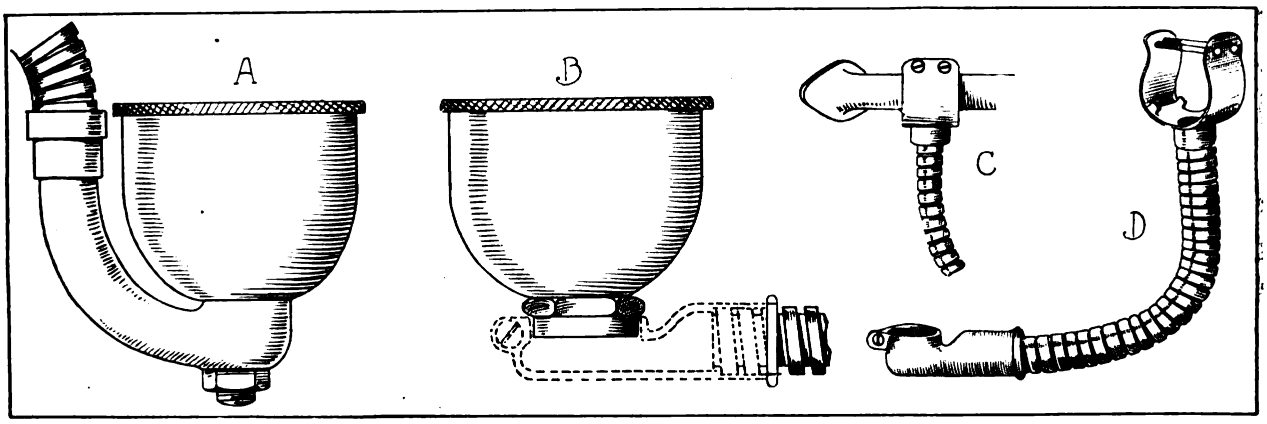
Mechanical Pointers for Garagemen and Repairmen

HOT AIR IN CARBURETION.

Carburetion is an important factor with the gasoline automobile, and motorists are continually experiencing more and more difficulty in obtaining a mixture making for easy starting and successful operation. When it is considered that the function of the carburetor is to blend certain proportions of vapor and air, and to maintain the proper values at varying motor speeds, it may be said truthfully that the manufacturer has made considerable progress towards perfecting the vaporizer. With motor fuel becoming heavier and heavier, the problem of carburetion is receiving greater attention from motorists than formerly when a more volatile fluid was utilized.

During the past year the fitting of carburetors with chambers for utilizing heated water or hot air to facilitate vaporization has become more noticeable, and many car makers also are employing a flexible tubing for conveying the heated air of the exhaust pipe to the air inlet of the vaporizer.

To understand the function of the heated air and its proper application it should be borne in mind that the air drawn into the carburetor by the suction of the piston, passes over the spraying nozzle and the vapor is mixed with it, creating what is termed the mixture. The more perfect the mixture the quicker it burns and the more complete is the combustion. Rapid evaporization of the fuel is desirable and it is important that the mixture reach the combustion chamber without the value being changed.



Utilizing Heated Air Makes for More Efficient Carburetion in Cold Weather: A, Application of Col-Mac Hot Air Pipe to Schebler Vaporizer Having Elbow Bend; B, Showing Clamp for Attachment to Another Design; C, Method of Attaching to Exhaust Pipe; D, Flexible Tubing, Hood and Clamp.

It is held by one maker that air should be taken as free from atmospheric moisture as possible. He maintains that dried air will absorb moisture, that of the vapor, much more quickly and more perfect carburetion is obtained as a result. It is held that air should be taken into the cylinders as nearly as possible to atmospheric pressure and that expanded air is not desirable. Taking in dried, warmed air results in a slight expansion, but not to a harmful degree as the cold of the vacuum in the mixing chamber absorbs the heat and contracts the air quickly to less than its original volume.

Using heated air from the exhaust is not new, but considerable improvement has been made in its application. The adoption of flexible metal tubing makes for compactness and ease of installation. This is noticeable in the Col-Mac, manufactured by the Breeze Carburetor Company, Newark, N. J., various applications of which are shown in accompanying illustrations. It comprises a hood for attachment to the exhaust pipe, a suitable length of flexible tubing and means for securing the pipe to the main air port of the carburetor.

The size of the tubing conducting the heated air is important and while flexible piping could be attached by anyone familiar with it, the desired results might not be secured. The Breeze company conducted a series of tests before marketing its product, the experimentations including all types of motors and carburetors, and by giving the make of vaporizer, size, model and year of car, proper size is assured the purchaser.

The hood device is easily attached, being equipped with threaded bolts, which when removed permit of slipping the hood over the exhaust pipe. The hood is kept away from the exhaust member by upset brass pieces. This space permits the drawing in of primary air which is heated before it passes to the air intake of the carburetor. It is held that greater suction is possible because of the tubing.

Where there are two air intakes, an auxiliary and a main, and the latter contains the gasoline jet, the hot air pipe is attached to the main air permanently by a suitable fitting. Where the main and auxiliary air are taken through one port a larger tubing is required, for example, with the Schebler shown at A. On the 1.25-inch model D, and where the main and auxiliary air ports have been combined, tubing of 1.25-inch size is utilized.

A quality of the hot air intake device, in addition to making for successful carburetion, is that the entrance of dust or dirt is prevented. Some early designs of cars do not include a pan or undershield, the absence of which exposes the carburetor to foreign elements, allowing raw air to be drawn in and affecting vaporization. It is held that starting is aided in that a greater suction of air is made possible by the use of the tubing and that after the first few explosions hot air is drawn over the spraying nozzle.

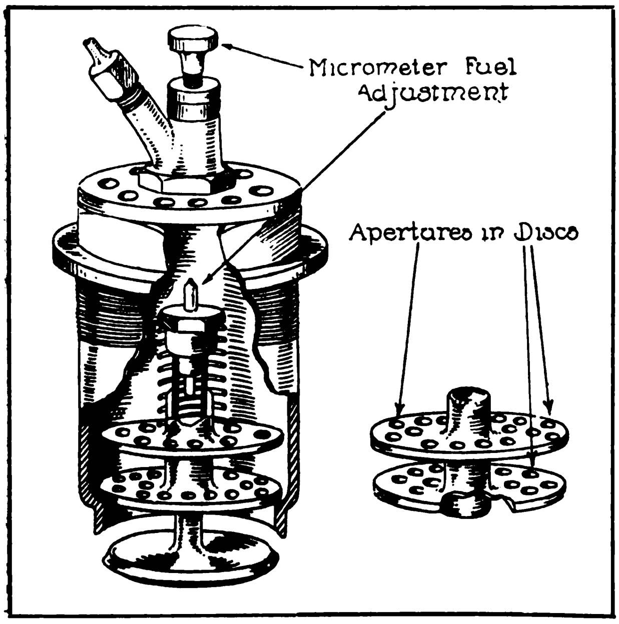


Fig. 1—The Carlton All-Fuel Carburetor, a Valve Type of Vaporizer Having Double Discs.

CARLTON ALL-FUEL CARBURETOR.

Some time ago attention was called in these columns to the development of the heavy fuel vaporizer abroad and to the compactness of one design, that of the Durr. A device that is claimed to be even smaller than the Durr is the Carlton all-fuel carburetor, an English design, mention of which was made in the recent issue of the Commercial Motor.

A quality of the Carlton emphasized is that gasoline, benzol or kerosene may be successfully vaporized, although starting is not possible with the heavier fuel without resorting to heating. As will be noted by the drawing presented at Fig. 1, the vaporizer is of the valve controlled type and the principle of operation is said to be such that the several fuels may be successively employed without any alteration or adjustment, and with a clean exhaust.

It will be noted that the feed may be regulated by a screw arrangement and that the needle, which is spring mounted in the top of the induction valve itself, sits directly into the bottom orifice of the fuel pipe. The feed arrangement is therefore extremely simple, and as ample means of adjustment are provided, there is practically nothing to do after the first setting.

One of the interesting features of the vaporizer is the double-disc baffle plate, in which a large number of holes are so drilled relatively as to be in no sense opposite to each other. This results, it is stated, in a high degree of atomization of the fuel as it is drawn past the discs and onwards into the induction pipe.

PISTON RING CLAMP.

While it is an easy matter for the workman to replace a cylinder over the piston rings when aided by his helper, it is sometimes troublesome when the work is attempted alone. There are various methods employed, also clamping devices, but that illustrated at Fig. 2 E is of particular value in that it may be operated easily and individually.

It is made from sheet metal, rolled to the form shown at D and provided with two wings or extensions to take a threaded bolt carrying a wing nut. The clamp is slipped over the piston and rings, and the nut screwed up, compressing the rings into place. The cylinder is then slid over the piston, and the tension of the clamp relieved. As the cylinder moves downward, it will slide the clamp along. The piston should be well lubricated before the device is secured to prevent binding.

RENEWING TEETH IN FIBRE WHEEL.

The repairman is often called upon to exercise his ingenuity in making repairs, especially when the owner cannot wait for a new part to be shipped from the factory. An instance of this kind occurred recently when a fibre timing gear became damaged through a small piece of metal getting between its teeth when the motor was operating.

A piece of square fibre was secured, this being slightly wider than the thickness of the wheel. The latter was then sawed as shown at Fig. 2 B and the surfaces smoothed up with a file. The block of fibre was cut to make a driving fit, after which a template was made from the good teeth, for marking off the required members on the insertion. These were cut with a hacksaw, smoothed and trued with a file, after which two circular brass plates were turned up and placed in the position shown at C. The plates were then secured by rivets.

MORGAN TOOL HOLDER.

A handy tool holder, in that it combines the function of a number of similar devices, is the Morgan, manufactured by B. Morgan of Newport, R. I., and shown at Fig. 2 F. It is made in three sizes, A, B and C, respectively, A and B being designed for service with tool post holders on 12-14 and 10-12 inch lathes.

The holder is constructed from hardened steel, accurately machined, and will hold securely round, flat, square, hexagon and shaped tools in the tool post from the largest size of tool to a No. 60 drill. The two machined parts are held together by a slotted link, keeping them parallel as regards side motion, but allowing the two parts of the holder to swing around to a straight line and to reverse their position.

The heavy portion of the holder has a deep V slot on one side and a hair line on the opposite, while the smaller or lighter bar has a V slot on one side and is plain on the other. The V slot in the lighter portion registers with the deep V slot in the heavy section, which enables large tools to be held. When the tool is reversed the small or hair line slot has a plain or blank bar opposed to it, enabling the clamping of the lightest of drills. A complete set of tools is manufactured, there being 11 in all, and the sizes vary according to the equipment. At G is shown the holder on the square and with a diamond point inserted.

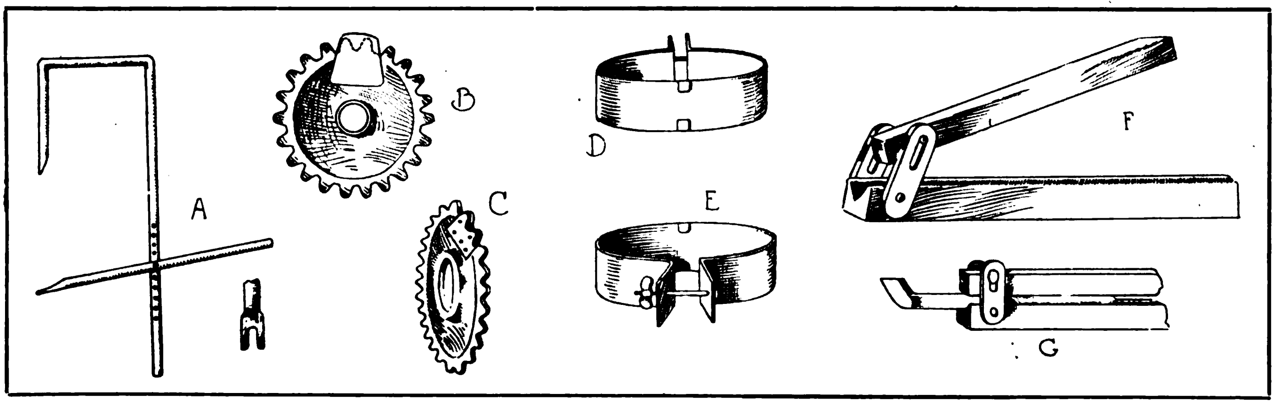


Fig. 2—Tool Equipment for the Repair Shop: A, Easily Constructed Valve Lifter; B and C, Replacing Broken Teeth in Fibre Gear; D and E, Piston Ring Holder; F, Morgan Tool Holder; G, Holding a Diamond Point Tool.

MAKING A VALVE LIFTER.

The average repairman has in his tool kit a valve lifter which he prizes, in that it is suitable for the majority of motors. Occasionally, however, a car will come into the shop to be overhauled and upon disassembling the motor it will be found that the regular valve lifter does not accomplish the work easily.

A simple form of tool for compressing valve springs while retaining key is withdrawn, is presented at Fig. 2 A. It is a common type, but as it is easily made it may be of service to some workman who encounters an engine not adapted to the regular lifter. It will be noted that the fulcrum member is provided with a number of holes for adjusting the lever to varying heights of the cylinders. The retaining bolt is threaded at one end to take a wing nut. The material can usually be secured from the scrap heap.

TRUING GRINDING WHEELS.

It is important that grinding wheels be kept true if satisfactory work is to be expected. Provision should be made for truing the wheel with a diamond, rigidly supported in a most convenient holder, which is the best methed. This produces a true and smooth surface on the periphery of the wheel and enables it to cut smoothly. It is a fundamental principle in grinding that a smoother surface than that of the wheel cannot be produced on the work, and if the wheel is to cut smoothly its surface must be true.

Dressing is not truing, but sharpening the wheel, and a dresser should never be used on wheels that grind round work. When truing a wheel the diamond should be held in a rigid tool post on the table of the machine. Truing by hand with a piece of emery brick is unsatisfactory for producing good work.

HARDENING CAST IRON.

Many times it is convenient to make an article of cast iron that needs to be finished, and which should be very hard. Cast iron can be hardened as easily as steel, and to such a degree that a file will not touch it. Take one-half pint of vitriol, one peck of common salt, one-half pound of saltpetre, two pounds of alum, one-quarter pound prussic potash, one-quarter pound of cyanide of potash, all to be dissolved in 10 gallons of soft water. Heat the iron to a cherry red and dip it into the solution. If the article needs to be very hard, heat and dip the second or even the third time.

CORRESPONDENCE WITH THE READER.

Function of Spiral Springs.

(132)—To settle a debate in regard to the use of two spiral springs situated at the base of the steering gear tubing, one on the lead rod and the other on the throttle rod on a model T Ford, I would like to have your opinion as to the purpose of these two springs and the duties they perform. C. R. H.

Somerville, Mass., Jan. 28.

The members referred to are employed for preventing the movement of the levers except when desired by the driver, or in other words, the springs retain them in the position in which they are placed by the driver.

The spark and throttle levers are a part of the rod extending through the tubing housing to the steering column, being bent at the top to form the control members. Each lever has a tooth or sharp edge which meshes with similar teeth on the stationary ratchet plate affixed to the tube member.

At the bottom of each rod is placed the spring referred to and its function is to restrict the upward movement of the rod, yet at the same time permit the lever to be moved over the teeth. The tension of the spring is sufficient to hold the lever in the position set. If these springs or a similar arrangement were not employed the lever would move freely, resulting in the increasing or decreasing of the lead or the opening and closing of the throttle when not desired.

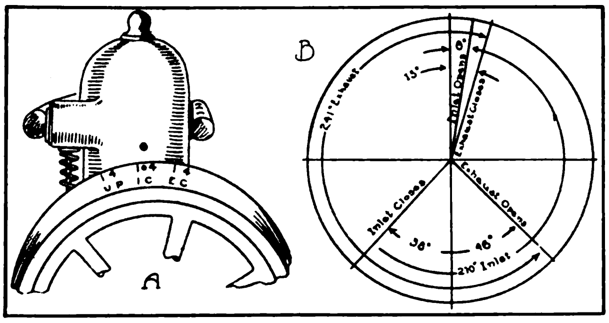


Fig. 1—Valve Timing with Unmarked Flywheel: A, Showing How Cylinder May Be Prick Punched and Flywheel Marked After Degrees Are Laid Out by Diagram Indicated at B.

The design has been employed by the maker of Ford cars for some time, it having been fitted to the early models, and it may be stated that it is distinctive of the Ford product. It rarely gives trouble and is easily operated and adjusted as to wear.

Valve Timing.

(133)—I have an old car and in overhauling the motor removed the camshaft without marking the gears for remeshing and these were not marked at the factory. I wrote the maker for the timing plan and received it, but the flywheel is not marked with the valve openings and the plan sent me is for degrees. The diameter is 17 inches. How should I go about it to put back the camshaft? READER.

Louisville, Ky., Feb. 8.

To replace the camshaft and remesh the gears it should be borne in mind that having the timing order and the diameter of the flywheel the gears should be meshed so that the cam actuating the intake valve of the first cylinder should begin to move and lift the valve when the flywheel is rotated a certain number of degrees.

Assume that the motor is a four-cylinder unit and the valve timing is as follows: Intake opens eight degrees past upper dead centre and closes when it is 38 degrees past lower dead centre. The exhaust opens 46 degrees before the lower dead centre and closes 15 degrees past upper dead centre. This indicates that the inlet opens and closes late and that the exhaust opens early and closes late.

The flywheel being 17 inches in diameter it is a simple matter to lay out the degrees on its periphery or lay the latter out by inches. The figures will be as follows: Inlet valve opens late 1.1875 inches, closes late 5.65625. Exhaust valve opens early 6.84375 and closes late 2.234275. Top and lower dead centres are essential and these may be secured by turning the flywheel until the pistons of the first and fourth cylinders are at the top. Mark the flywheel for these positions and make a prick punch mark on the rear cylinder as indicated at Fig. 1, A.

Next measure off 1.1875 inches on the periphery of the flywheel to the right and the inlet valve opens late. Turn the flywheel to the left until the mark registers with that on the cylinder and replace camshaft, meshing the gears in such manner that the inlet valve of the first cylinder will begin to lift. After fitting the camshaft rotate the flywheel in the direction opposite to which it travels and then move it to the left to make sure that the inlet valve of the first cylinder starts to lift when the mark on the flywheel coincides with that in the cylinder.

The timing may be checked up for each valve to make sure the setting is correct by measuring off the distances on the flywheel and marking these with a prick punch. Assuming that the firing order of the motor is 1, 3, 4, 2, the marks on the flywheel will be as follows:

1-4, I-O ....inlet valves 1 or 4 open
1-4, I-C. ....inlet valves 1 or 4 close
1-4, E-O ....exhaust valves 1 or 4 open
1-4, E-C ....exhaust valves 1 or 4 close
2-3, I-O ....inlet valves 2 or 3 open
2-3, I-C ....inlet valves 2 or 3 close
2-3, E-O ....exhaust valves 2 or 3 open
2-3, E-C ....exhaust valves 2 or 3 close

The setting of each valve may be tested by rotating the flywheel in the normal direction until the mark on the flywheel for the inlet valve of the first cylinder registers with that on the cylinder and the balance of the valves are checked in a similar manner. If the valve lifting mechanism is adjustable, it can be changed to correspond with the marks on the flywheel.

Functions of Charts.

(134)—I notice from time to time a chart or diagram used in some of the articles appearing in your magazine, especially in connection with stories on electric lighting. The application is not clear to me. Why and what are they for? PUZZLED.

Sumter, N. C., Jan. 12.

The charts or diagrams referred to are utilized to illustrate the performance of the dynamo, for instance, and provide a compact and clear method of showing the characteristics of the machine. The lines or curves represent the actual performance at varying speeds, loads, etc., and any number of lines may be employed, depending upon what is to be shown.

A chart utilized in connection with a dynamo and for illustrating its output and the variation of the voltage of the battery, is depicted at Fig. 2, and an explanation of the curves will best illustrate the function of the particular chart. It will be noted that at the extreme left of the squares is a vertical row of figures with zero at the bottom and 13 at the top. These are marked amperes. At the right is another series of vertical figures, from zero to eight, and marked volts. The horizontal line of figures, starting with zero and ending with 3000, denotes the revolutions a minute of the dynamo. At the top of the chart, running from left to right, starting with zero and ending with 66.7, is the line representing the car speeds.

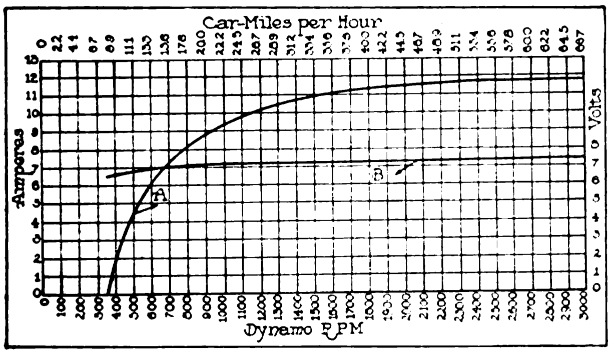


Fig. 2—Chart Utilized to Show Volume and Current Curves of Dynamo Wound for 12 Amperes, Also Voltage Variation of Battery.

This chart is intended to show the voltage and current curves of a dynamo wound for 12 amperes. connected to a six-volt battery which is fully charged and not supplying current to the lamps, for example. It will be noted that there are two curves, one marked A and the second B. The former represents the current and speed characteristics of the dynamo with no current being drawn from the battery, although the cells are being charged by the generator.

This curve starts at the bottom of the chart between the figures 300 and 400. As these represent the speed of the dynamo, it is obvious that the current is cut-in at 350 revolutions a minute. As the output or amount of current of a generator increases proportionately to the speed, the number of amperes will increase correspondingly. The line shows a gradual curve beginning at 350 and moving upward and to the right until the dynamo attains its maximum output of nearly 12 amperes at the highest point of the curve which is at about 2500 revolutions.

It is an easy matter to ascertain the number of amperes at any stated revolution above 375. For example: The output in amperes of the dynamo at 1000 revolutions a minute is desired; the 1000 mark on the lower horizontal line is located and followed upward vertically until the line intersects the curve, which in this instance would be slightly over nine. This shows the ampere output, and that for any speed may be determined similarly.

The upper horizontal row of figures shows the car speed corresponding to that of the dynamo. For example: If the output is 11 amperes and at 1500 revolutions a minute of the dynamo and the car speed is desired, find 1500 on the lower horizontal row and follow the vertical line to the top, where it will be seen that the car speed for this ratio is 33.4 miles an hour.

In this chart the engineer desires to show the voltage variation at the battery when the latter is being charged and the dynamo is operating over a range of from 350 revolutions a minute to 3000. This is represented by the curve lettered B and the volt column is at the right of the chart. At 350 revolutions, when the current is cut-in to the battery, the voltage is 6.5. This is seen by following the vertical row of figures at the left of chart. Beginning at 6.5 volts the rise of the curve is very gradual and slight, being but one volt from 350 to 3000 revolutions a minute. This demonstrates that the voltage is held steady, a point the engineer wishes to emphasize.

The chart shown at Fig. 3 is similar with the exception that it explains the action of a dynamo wound to generate 16 amperes. In connection with this drawing it will be noted that curve A represents the current and speed characteristics, while B shows the voltage at the battery as with the chart depicted at Fig. 2. Curve A of the second chart shows that the maximum output of the dynamo is attained at 2000 revolutions a minute and that it is held constant at higher and excessive ratios.

Charts are usually employed by engineers as they give essential information in a very compact and comprehensive manner.

Fitting Lighting Dynamo.

(135)—Am seriously considering fitting a lighting dynamo to my car and wish to locate it on the transmission housing as there is not room on the motor because of several accessories such as the power tire pump, etc. Cannot the generator be driven off the clutchshaft by chain, belt or gears and how would the dynamo have to be geared? SUBSCRIBER.
Pensacola, Fla., Jan. 26.

The dynamo could be located as stated, although the majority of generators are mounted near the power plant and drive is taken from the crankshaft or camshaft. The method of installation and ratio of drive would depend upon the machine, the make of which was not given, and the dynamo. They are driven at varying speeds according to the design.

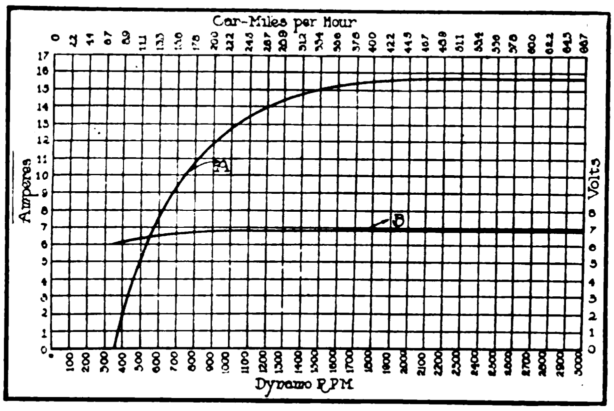


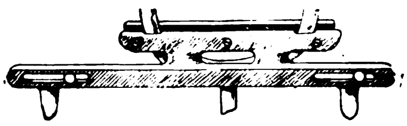
Fig. 3—This Chart Differs from That Presented at Fig. 1 in That the Output of the Generator Is 16 Amperes.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Security Ford License Holder, made by the Security Company, 14 Shingiss street, Pittsburg, Penn., is designed for model T Ford cars and a feature emphasized by the maker is that it permits of attaching the license plate to the right hand light bracket instead of the radiator. The holder comprises a split clamp member for securing it to the lamp iron while the lower part of the device is adjustable, permitting of the use of several sized plates.

Security Ford License Holder



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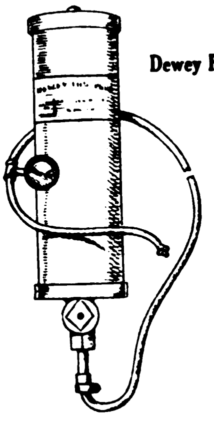
Takoff is produced by Hopewell Bros., Newton, Mass., and is a pumice hand soap paste, made especially for mechanics and those desiring a mixture which will remove all grease and grime from the hands without injury to the skin. It lathers easily and only a small quantity is necessary. It contains no acids or injurious chemicals, and is held to be aseptic. It comes in a neat can and is inexpensive.

—— ★ ——

The Dewey Power Tire Pump is manufactured by the Dewey Anderson Company, 420 Knapp street, Toledo, O. It is very light and compact, is but 12 inches in length, and being of brass cannot rust or corrode. All working parts are accurately machined and the pump may be installed permanently on the motor by the utilization of a special connection made by the company. This is accomplished by using a priming cock opening. The Dewey may also be used by removing a spark plug and screwing the pump into the opening by hand. Another method is to tap one of the valve plugs, connecting a tubing with the pump which may be located as convenient. Pure air is taken into the pump and forced to the tire through an ample length of hose having a woven cloth covering, the proper pressure being indicated by a dial pressure gauge.

TAKOFF
FOR MECHANICS
HOPEWELL BROTHERS
LATHERS FREELY
QUICKLY — EASILY REMOVES
GREASE — GRIME
KEEP COVERED AND MOIST
TAKOFF

Takoff



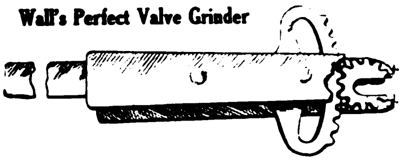
Dewey Power Tire Pump

The Dewey does not require lubrication and is very efficient at low motor speeds. It is moderately priced.

—— ★ ——

Wall's Perfect Valve Grinder, made by J. H. Wall, 290 Hope street, Bristol, R. I., will appeal to owners of model T Ford cars, in that the valves may be ground without removing them or displacing the cylinder head. The grinder is so designed that the rotating member engages with the pin securing the valve spring collar, the tool being fitted by lifting the valve spring slightly. A little kerosene is applied to the valve which cuts the carbon, and by working the handle of the grinder back and forth, a rotating movement is imparted. This loosens all carbon and cleans the seat perfectly, insuring proper compression and maximum power. If the valves have been neglected for any great length of time, and are in bad condition, an abrasive may be employed and the tool utilized without removing the valves or head. The grinder is constructed of high grade material, will endure indefinitely and simplifies the work of keeping the valves and seats in proper condition. Each tool is guaranteed.

Wall's Perfect Valve Grinder



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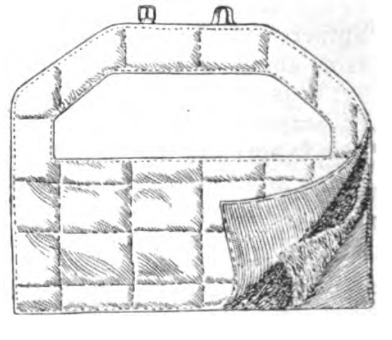
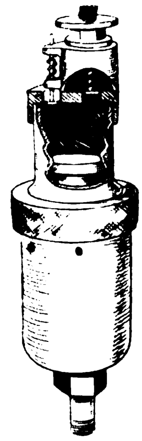
The J-M Keystone Radiator Shield is marketed by the H. W. Johns-Manville Company, New York City, and is constructed for attachment over the front surface of the cooler, keeping the water and motor warm when the machine is left exposed to the cold. It consists of a thick layer of cleansed cattle hair neatly quilted between two layers of water proof imitation leather, and nicely stitched. A flap is provided for exposing the upper part of the radiator when the car is being operated and for closing when the machine is standing.

J-M Keystone Radiator Shield



The National Power Tire Pump, manufactured by the National Motor Supply Company, Cleveland, O., is a compact unit and is fitted in the spark plug opening of the cylinder. The design is such that it will operate equally well on small or large motors and will inflate the largest tire in a very short time. The National takes in and pumps fresh air to the shoes, by means of an inlet and outlet valve, these being actuated by a leak proof piston. An air receiving chamber is located between the outlet valve and tubing for the purpose of storing the compressed air and allowing it to flow gradually during the downward stroke of the piston. The rubber tubing is 12 feet long, covered with woven cloth, and a pressure indicator is fitted. Special connections are utilized. High grade material and workmanship are incorporated.



National Power Tire Pump

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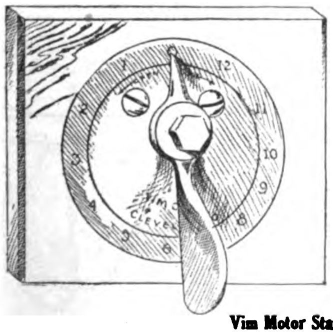
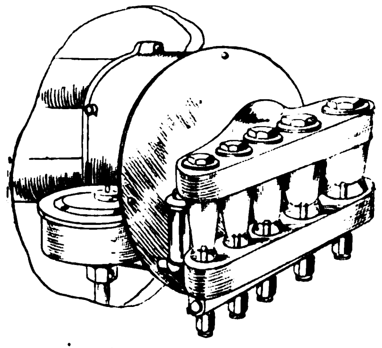
The Vim Motor Starter, marketed by the Vim Manufacturing Company, Cleveland, O., is of the acetylene type, priming the cylinders with a proper mixture of the gas and air, the explosive vapor being fired by the ignition spark. The acetylene is led from the tank to the dash, thence to the intake manifold of the motor and the control unit is of special construction. This not only is operated easily from the seat, but it is held by the maker that it is impossible for the acetylene to leak. The dash device is very neat, comprising a numbered dial and a lever. By moving the latter to the proper number the desired mixture is secured. The Vim motor starter is very compact, weighs slightly over a pound, and the maker states it may be fitted in 30 minutes.



Vim Motor Starter

*

The Gardner Visible Carburetor is the product of the Gardner Carburetor & Brass Works, Shreveport, La., and differs from those of ordinary construction in that springs are eliminated. A feature of the device is that its action is visible, the mixing taking place in a row of graduated glass tubes on the dash in plain view of the driver. Each mixing tube has a separate nozzle and needle valve for controlling the flow of gasoline, and the effect of the adjustment is indicated. By utilizing several mixing tubes it is held that greater flexibility is possible, as well as economy of fuel. Heated air is utilized and a fluid gauge is part of the equipment.



Gardner Visible Carburetor

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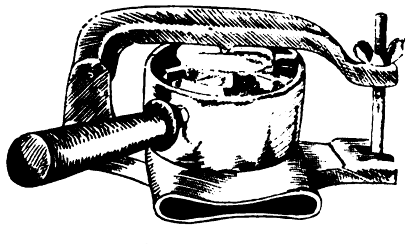
The Shaler Vul-Kit has been brought out by C. A. Shaler, Waupun, Wis., to meet the demand for an efficient, low priced vulcanizer of the automatic type. Its simplicity of operation will appeal to motorists not familiar with repairing inner tubes as all that is necessary is to fill the puncture with new rubber, clamp down the vulcanizer, fill and light the generator. The latter is supplied with gasoline which when ignited, automatically produces the proper temperature for curing the rubber. A universal clamp insures proper pressure and a special handle permits of removing the vulcanizer when hot without danger of injury to the operator.



Shaler Vul-Kit

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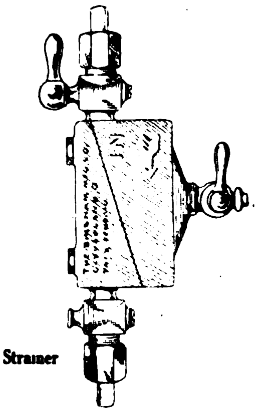
The Phinney-Walker Keyless Clocks, marketed by the Coward Auto Supply Company, Boston, are made in several styles and finish to match the trimmings of the car. A feature of the clocks is that they may be wound by rotating the rim. The construction is designed to prevent theft. They are neat in appearance, reliable time keepers and adapted for hard usage.

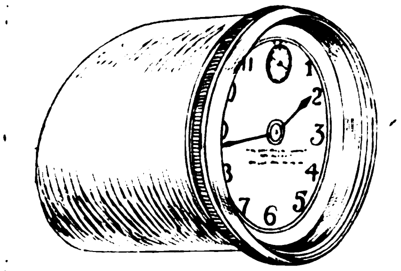
*

The Shurecleen Strainer is produced by the Bingham Manufacturing Company, Cleveland, O., and is a compact device for separating water and foreign elements from the fuel. It is designed for attachment in the main line between the supply tank and the carburetor and differs from those of conventional practise in that three petcocks are fitted. One controls the flow of liquid to the filter, the second



Shurecleen Strainer

shuts off the fuel to the carburetor and the third is utilized for removing all accumulations or for drawing off gasoline if desired. The device is moderately priced.



Phinney-Walker Keyless Clocks

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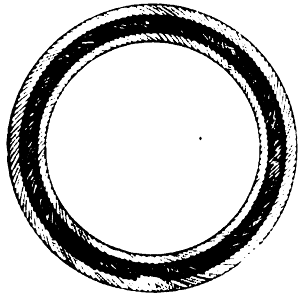
The Miller Self-Vulcanizing Tube, marketed by Chas. E. Miller, Anderson Rubber Works, Anderson, Ind., is designed to automatically seal any openings or punctures. It comprises a layer of plastic rubber between two walls of cured rubber and when the tube is punctured the opening is filled by the plastic material which forms into a solid mass. It is constructed for both motorcycles and automobiles and the maker points out that it contains about four times as much rubber as the ordinary tube. It is also held that the plastic material will not dry out or lose its efficiency under severe service.

★

The Apex Radiator Cleanser is produced by the United States Compound Company, Buffalo, N. Y., and by placing a small quantity in the cooler and allowing it to remain about a week, all scale, etc., is dissolved. The water is drawn off to remove the foreign elements and a slight amount of the cleanser added to the fresh supply. This keeps the radiator in a clean and efficient condition and prevents injury through the use of hard water.

Miller Self-Vulcanizing Tube



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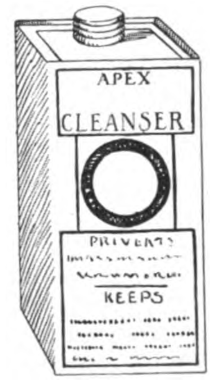
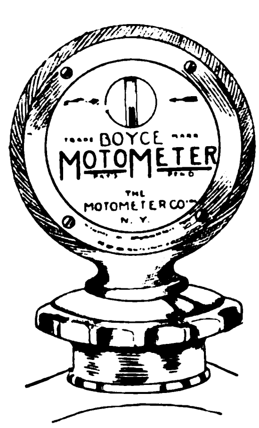
The Motometer, marketed by the Motometer Company, Inc., 1784 Broadway, New York City, is a compact device for mounting on the radiator cap and its function is to register the temperature of the water, thereby preventing damage to the motor through overheating or by freezing. Between two crystals retained in a casing, is a silvered dial, indicating the temperature readings. A special red fluid is actuated by the heated air between the water level and roof of the cap and its height is plainly discernible on the dial, being read easily from the seat even in the night time. The Motometer will register from zero to the boiling point of water, is very compact and attractive, and is easily installed. It is gold or nickel plated as desired.



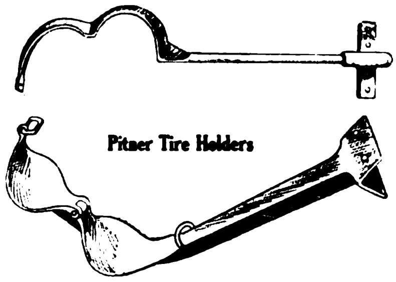
Apex Radiator Cleanser



Motometer

★

The Pitner Tire Holders, manufactured by the Pitner Pump Company, Chicago, are designed for cars using platform springs. They carry one or two spare shoes and being constructed of malleable iron will withstand severe service. They come complete with straps and all fittings, are nicely finished in black and are inexpensive.



Pitner Tire Holders

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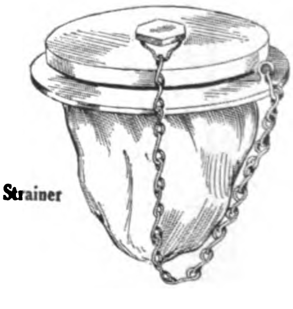
The Liggett Tank Strainer is manufactured by the Liggett Spring & Axle Company, Cleveland, O., and is designed for three purposes, a filling hole for the fuel tank, a funnel and a strainer. A flange is fitted to the tank and the cap is provided with a chain attached to the flange member. The strainer member consists of a chamois and may be removed easily for displacing water or foreign elements when desired. The maker holds that the chamois has as much surface as an eight-inch funnel and that the diameter of the hole, 3.25 inches, permits of cleaning the fuel tank. The strainer is of polished brass, very light and easily attached.

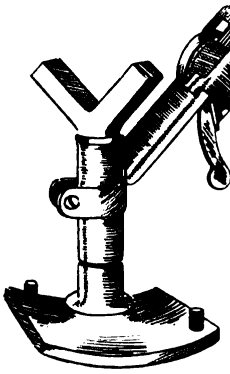
★

The Morgan Friction Igniter is manufactured by B. Morgan, Newport, R. I., and although designed for lighting the acetylene lamps of the motor car, it also may be utilized with the household illuminating gas. It is very compact and is attached to the acetylene burner by a screw actuated clamp which slips over its base. The igniter is operated by a lever



Liggett Tank Strainer

which when lifted and allowed to snap back, produces a shower of sparks in the path of the escaping gas. The friction material is inexpensive and may be replaced when worn.


Morgan Friction Igniter

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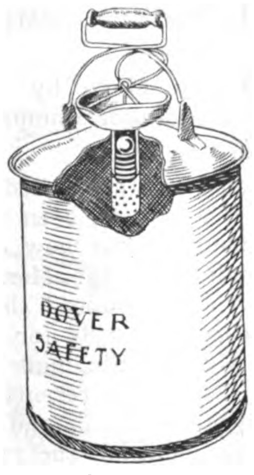
The Dover Safety Gasoline Can is a new product of the Dover Stamping & Manufacturing Company, Cambridge, Mass., and among its practical qualities is a self-closing feature which prevents the evaporation of the fuel, as well as eliminates opportunity of explosions. The device comprises a large brass ball ground into a valve and normally held closed by a spring. The valve member is surrounded by a gauze chamber, preventing fire reaching the vapor or contents of the can when pouring or filling. In the five-gallon size the valve opens and closes automatically when pouring, but cannot open accidentally. On the one-gallon and one-quart sizes the valve is held open by a slight pressure of the thumb, closing when released. The cans are constructed of heavy galvanized steel, painted red and stencilled "Gasoline." Economy of fuel is effected by the air tight qualities. The containers are moderately priced.



Dover Safety Fuel Can

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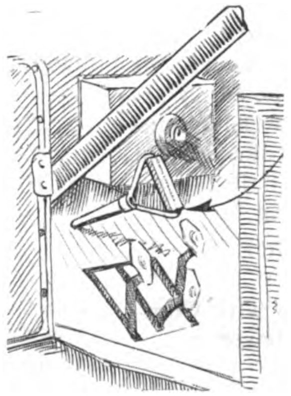
The Triplex Motor Starter is the product of the Bremer-Wilson Manufacturing Company, 1256 Michigan boulevard, Chicago, and is designed especially for model T Ford automobiles. It operates on the mechanical principle, a handle being conveniently located at the base of the dash and within easy reach of the driver. The starting mechanism is secured to the crankshaft of the motor and is actuated by a chain carried in a suitable casing and connected to the handle member. By pulling the latter a quick movement is imparted to the crankshaft and in the same direction as when the engine is rotated by the usual starting crank. The mechanism is such that a back fire breaks the contacts. It is pointed out by the maker that the simplicity of the design is such that the device may be installed in an hour and that no drilling or mechanical work is necessary. The fitting does not interfere with the usual starting handle, which may be employed in the ordinary manner when desired.


Triplex Motor Starter

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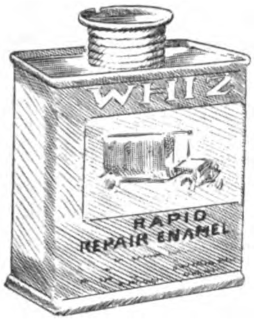
Whiz Rapid Repair Enamel is manufactured by the R. M. Hollingsworth Company, Camden, N. J., expressly for quickly repairing the enamelled parts of automobiles and motorcycles. Its function is to conceal disfigurements which would otherwise detract from the appearance of a car, and when applied to wood, metal or upholstery, dries in five minutes, leaving a hard, smooth and water proof surface. It comes in half-pint cans.



Whiz Rapid Repair Enamel

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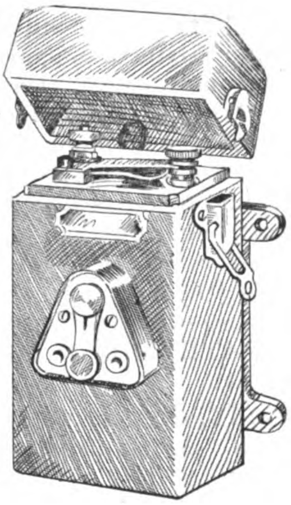
The New York Master Vibrator is manufactured by the New York Coil Company, 338 Pearl street, New York City, and also is designed for model T Ford automobiles. The vibrator is of special construction and the maker states that the condenser is unusually powerful. The vibrator synchronizes the spark and is connected in series with the regular coil, the vibrators of which are short circuited. This eliminates the trouble of adjusting extra units and makes for more power in that accurate timing of the spark is made possible. The contact points are of platinum-iridium, and the maker states that they seldom require attention.


New York Master Vibrator

PEERLESS' EXPANSION PLANS.

With Additional Capital and New Stockholders Decided Growth Is Anticipated.

The Peerless Motor Car Company, Cleveland, O., maker of Peerless pleasure and commercial cars, is planning to increase its truck business in 1913, and has raised its authorized capital from $3,000,000 to $10,000,000. Several new stockholders have taken personal interest in the concern, among whom are: F. S. Terry, H. A. Tremaine, B. G. Tremaine, J. B. Crouse and J. Robert Crouse.

REORGANIZING KNOX COMPANY.

Will Specialize in Six-Cylinder Pleasure Cars, Fire Apparatus and Martin Tractor.

Arrangements for the reorganization of the Knox Automobile Company, Springfield, Mass., maker of Knox pleasure and commercial vehicles, are in progress. The company was recently petitioned into bankruptcy and Edward O. Sutton, Harry G. Fisk and Charles C. Lewis of Springfield were appointed receivers. It is reported the company will standardize the manufacture of six-cylinder pleasure cars, the Martin tractor and fire apparatus.

BUYS FISK RUBBER STOCK.

John N. Willys Purchases Interest in Tire Company Seeking Massachusetts Charter.

John N. Willys, president of the Willys-Overland Company, Toledo, O., maker of Overland cars, has purchased an interest in the Fisk Rubber Company, Chicopee Falls, Mass., maker of Fisk tires. It is stated that Mr. Willys' purchase is merely in the nature of an investment in a substantial firm and he will not become an officer or director of the company, taking no active part in its management. Harry T. Dunn, president, and Harry G. Fisk, secretary-treasurer, holding the majority of the stock. The company, which was a Delaware corporation, is being reincorporated under Massachusetts laws and the Massachusetts company will take over the assets of the Delaware concern. The authorized capital is $15,000,000.

PATHFINDER DRIVERS NAMED.

Robert Speigel and Dr. Charles G. Percival Will Act as Cross Country Pilots.

When the Indiana automobile manufacturers hold their third annual tour, which this year will be from Indianapolis to the Pacific Coast, one or more Pathfinder cars, made by the Motor Car Manufacturing Company, Indianapolis, will be entered. These machines will be driven by two well known veteran cross country pilots. One of these is Robert Speigel, who achieved considerable fame in the Los Angeles to Phoenix road race, and the other, Dr. Charles G. Percival of New York City, the pathfinder and traveller, who has just written an account under the title of "The Trail of the Bull Dog," of his famous two years' journey of 50,000 miles, extending from Mexico to the borders of the Arctic Circle.

NEW OIL CONCERN.

Invader Oil Company Acquires Business Heretofore Conducted by Chas. F. Kellom & Co.

The entire business and good will of Chas. F. Kellom & Co., Philadelphia, Penn., maker of Invader oils, has been acquired by a new corporation to be known as the Invader Oil Company. T. E. Tomlinson, one of the first men to study the development of special oils for automobile use and who became known nationally as the creator of Havoline oil, will be vice president and general manager of the new concern. Charles F. Kellom will be president and the Kellom manufacturing and selling organization will remain intact.

LEAVES AUTOMOBILE INDUSTRY.

F. E. Dayton Resigns After Long Record with the Manufacturer of Columbia Cars.

F. E. Dayton, who has been sales manager of the Columbia Motor Car Company, Hartford, Conn., maker of Columbia cars, for about 10 years, or since the time of the Electric Vehicle Company, has resigned coincidentally with the announcement of his appointment as general manager of the National Incinerator Company, with executive offices at New York City, a foundry at Albany, N. Y., and erecting plants all over the country.

MAXWELL MOTOR COMPANY.

Declaration of Policy Made by Reorganized United States Motor Company.

The reorganization of the United States Motor Company appears to have been fully accomplished and the name of the new concern has been decided definitely as the Maxwell Motor Company, Inc. It is announced that the concern will produce four models for the coming year, as follows: Maxwell Six, models 40 and 50, formerly the Everitt and more recently the Flanders, and the Maxwell, models 25 and 35, four-cylinder machines. In addition the regular Maxwell, models 22 and 40, and the Stoddard-Dayton, models 30, 38 and 48, will be continued for the present. Owners of Columbia, Brush, Sampson and the other cars formerly made by the United States Motor Company will be cared for by a plant at Newcastle, Ind.

Recent Patents of Interest

Anklam Lamp.

William F. Anklam, Detroit, assignor to the C. M. Hall Lamp Company of that city, has been granted a patent for an electric lamp having an adjustable parabola mirror. The conventional practise is to secure the desired focus of the light by moving the bulb, but in the Anklam device the reflector member is slid backward or forward as the case may be. A post extends from the lamp casing and is provided with a socket for securing the bulb. The reflector is sleeved upon the post and also has a bearing in the cylindrical flange at the outer end of the reflector. A screw adjustment is incorporated, of a thread and nut type, and means are also provided for securely locking the lamp against the entrance of foreign elements.

Hallgren Valve Lifter.

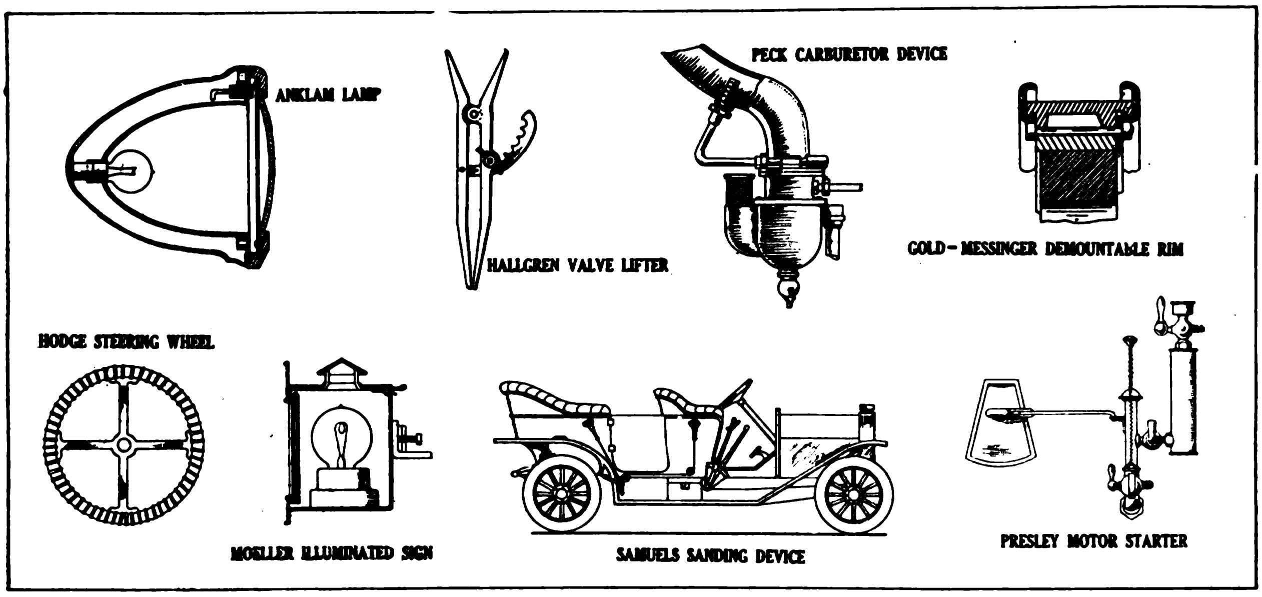
A valve lifting device, in which means are incorporated for locking when desired, has been patented by Bror Cal Ivar Hallgren, Pasadena, Cal. It comprises a pair of levers pivotally connected, and a segmental bar similarly mounted on one of the levers and having a series of recesses. The other lever has a slot through which the segmental bar extends, and a locking pin is pivotally secured to the slotted member. It is adapted in one position of the pin to register with the slot in the lever so as to allow free movement of the segmental bar, and in another position, to enter the slot, engage with one of the recesses and to lock the levers. A handle is provided for locking the pin member. It is held by the inventor that the valve spring may be compressed and the tool locked, permitting the use of the hands in extracting the cotter pin or in working upon the valve mechanism.

Peck Carburetor Device.

Elbert C. Peck, San Bernandino, Cal., has been granted a patent for an air mixing attachment for a carburetor. It comprises a supply duct leading from the vaporizer, a throttle valve rod, a pipe for supplying air to the supply duct and a perforated distributor nozzle. The latter is located at one end of the pipe and is tapped into the supply duct. The other end of the supply duct has an opening therein, a sleeve rotatably mounted, also an opening adapted to register with that of the pipe member. An arm is secured to the throttle valve rod and a similar member on the sleeve, these arms being connected by a link.

Gold-Messinger Demountable Rim.

A patent for a demountable rim has been granted Edgar L. Gold and Jacob H. Messinger, Nazareth, Penn. It comprises a wheel having a demountable rim, the combination with the felloe, and a band around it, whose periphery is flat at one side and flaring at the other and provided with transverse notches. The rim comprises a



Depicting Some of the More Recent Patents Applicable to the Motor Car, Including Valve Lifter, Carburetor Device, Steering Wheel, Sanding Apparatus and Motor Starter.

flat band having an internal bevelled bead at one edge adapted to contact with the flaring portion of the band and a plain bead at the other edge, whose internal diameter is greater than the external diameter of the flat portion of the band. The fastening ring has an axially projecting fin adapted to pass between the plain bead and the flat portion of the band and is pierced with openings registering with the notches. Removable bolts engage the openings and the notches.

Hodge Steering Wheel.

There is a general tendency to employ corrugated steering wheels to provide a better grip. Fred L. Hodge, Middletown, Conn., has been granted a patent for a steering wheel which consists of the conventional web spokes and wooden rim around which are wound coils of wire. The wood is recessed to prevent slipping of the wire which is also passed through apertures in the spokes. Means are provided for locking the ends of the wire.

Moeller Illuminated Sign.

An illuminated sign for motor cars has been patented by Henry A. Moeller, Central Falls, R. I. An electric light is enclosed within a frame member which has an open front. The casing is provided with oppositely arranged perforations and a frame is permanently secured back of the open front of the casing. The latter is also provided with an opening at the top. A transparent sign plate is located within the frame and is fitted with a removable member which secures the plate in position and has pintles which enter the perforations of the casing.

Samuels Sanding Device.

Various methods are employed for preventing the skidding of the car on wet roads, including tire chains and anti-skid shoes, but a novelty is presented in the patent of Lester W. Samuels, New York City, which covers a sanding device for automobiles. The right hand rear fender is constructed hollow and serves as a container for the sand. The lower extremity of the guard is provided with a spout having a valve which is manually controlled. Handles are located convenient to the driver and the occupant of the right hand rear seat, being actuated by a pull rope which opens the valve member, allowing a stream of sand to flow upon the tread of the shoe, providing traction.

Presley Motor Starter.

William J. Presley, Grand Haven, Mich., has patented a motor starter for internal combustion engines. The principle involved is that of priming the cylinders with a combustible fluid when the ignition is cut off and the motor stopped. A reservoir is provided for containing a volatile fluid, such as sulphuric ether, and the top of the container is fitted with a filler member resembling in construction a priming cup. A pump is connected to the reservoir and means are provided for conveying the fluid to the intake pipe or manifold of the engine, as well as a valve for controlling the flow of the liquid. The pump has a projecting plunger rod, spring controlled, also a latch adapted to hold the rod in an outward position with the spring under tension. A rod member connects the pump with the ignition switch and when the plunger is operated, forcing a charge to the cylinders, the ignition is cut off.

OTHER PATENTS GONE TO ISSUE.

Wheel Heater, Earl D. Shannon, Alpena, Mich. The steering wheel is hollow and contains a number of filaments heated by electricity. Means are provided for moving the heating members to concentrate the heat.

Vehicle Headlight, Herman C. Keininger, Pocahontas, Mo. The headlights are actuated by the steering mechanism of the car and move in conjunction with the front wheels.

Sparking Plug, Frederic William Erickson, New York City. The lower extremity of the shell is rounded and the electrode is ball shaped. An opening in the spherical member permits egress of the flame of the ignited mixture.

Electric Lamp Guard, Clarence H. Hunsberger, North Towanda, N. Y. A wire guard for electric lamps designed to be moved. Means are provided for locking the bulbs into position and for removing same when desired.

Carburetor, Charles M. Stroud, Minneapolis, Minn. The carburetor differs from those of conventional practise in that the level of the float chamber is but slightly above the bottom of the mixing chamber. The overflow of the fuel forms a shallow pool for starting purposes.

Igniting Device, Asmus Philippsen, Bridgeport, Conn. A device for igniting acetylene lamps. Sparks are created by a ratchet wheel device contacting with a sparking material.

Cushion Tire, Harrison A. Fry and Guy J. Bruce, Spring Lake, Wis. The interior of the tire is fitted with a holder member in which are located a number of looped springs.

Jack, Le Roy Willour, Ashland, O. The stub shaft is provided with a rotatably mounted wheel having a number of teeth and the operating crank is constructed to engage with the same. Means are provided for securing and reversing direction of the wheel member.

Acetylene Purifier, Albert B. Cobb, Waterbury, Conn. A gas purifier consisting of a casing having an outlet for the gas, a funnel in the top of casing, and a vertically arranged pipe closing the bottom of the funnel and opening into the upper end of the same, and a series of blades swivelled on the pipe below the funnel.

Vehicle Wheel, Charles Whitfield Barrett, San Jose, Cal. A vehicle wheel comprising a pneumatic clincher cushion surrounding a hub and means for securing clincher devices.

Insulating Support, George H. Morris, Glencoe, Ill., assignor to the Electric Storage Battery Company, Philadelphia. An insulating support for storage battery tanks comprising an insulating liquid receptacle having a supporting core of rigid material and a cap provided with yielding material adapted to overlie the core and with a flange or skirt depending around the receptacle.

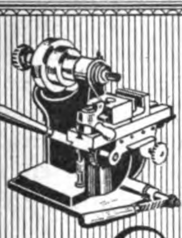
Tire, Heinrich Knoch, Adlershof, near Berlin, Germany. The combination of a felloe and a tire of solid blocks provided with laterally disposed grooves therein, rings sunk in said grooves with their outer faces flush with the outer side faces of said blocks, and means for fitting the flush sides of said blocks and rings for securing the tire to the felloe.

Sheet Metal Cutter, Ephraim L. Schanck, Delaware, O., assignor of one-fourth to M. C. Russell of the same place. A device for cutting holes in sheet metal, comprising a rotary cutting member, a support for same and a handle for actuating the cutter.

Shock Absorber, Thomas J. Mullen and Thomas F. Brennan, New Brighton, N. Y. Comprising an air bag in a reciprocating compression frame with a spring and means for attaching mechanism to the axle and body of vehicle.

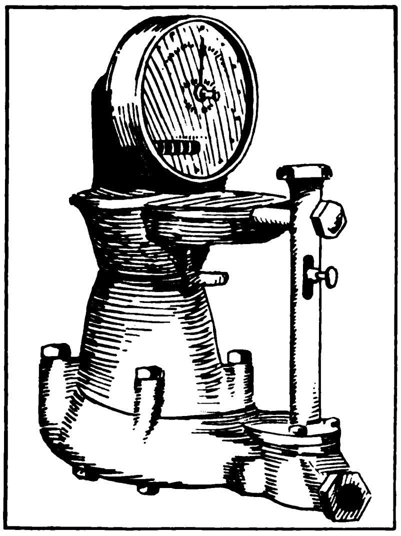
Spring Wheel, George L. Webb, Spencer, N. C., assignor of one-half to Michael L. Kiser, of the same city. The spokes of the wheel are fitted to a socket member and a spring is utilized between the spoke and hub of the wheel. The spring section of the spoke is provided with a packing and the space between it and the hub forms a compression chamber.

Motor Starter, Charles G. Adsit, Detroit, assignor of one-fifth to Sidney B. Winn, one-fifth to George H. Brown, one-fifth to Charles H. Land, Jr., and one-fifth to Nathan H. Jewett, all of the same city. The device comprises a carburetor, a pump and an electric motor to drive the pump. Each cylinder is fitted with tubing having ball check valves, also a solenoid for each valve to lift it from its seat. A rotary selector is connected to the solenoids and means are provided to supply an explosive mixture to each valve casing.



Up-To-Date Shop & Garage Equipment

AMERICAN COMPRESSORS.



Trident Auto-Stop Meter Utilized with Hydraulic System.

The American Steam Pump Company, Battle Creek, Mich., maker of pump machinery, is manufacturing a line of motor and belt driven air compressors for garage and service stations. The design known as size 1 is compact and the entire outfit includes electric motor, compressor, air tank and automatic controller. The last named is mounted upon a slab 14 by 16 inches, with gauge, switch and fuse blocks, and is perfectly automatic in its action, stopping and starting the compressor at adjusted pressure limits, which may be changed readily as desired. The motors are constructed for alternating or direct current, single phase or polyphase and the best of material and workmanship is incorporated.

The compressors have cross heads with adjustable bronze shoes working in bored guides, bronze connecting rods and cranks of forged steel. All bearings are adjustable for wear. The company also manufactures two-stage belted compressors. Special discounts are offered to the trade and a catalogue will be mailed upon request.

LUBRICATING OIL CABINETS.

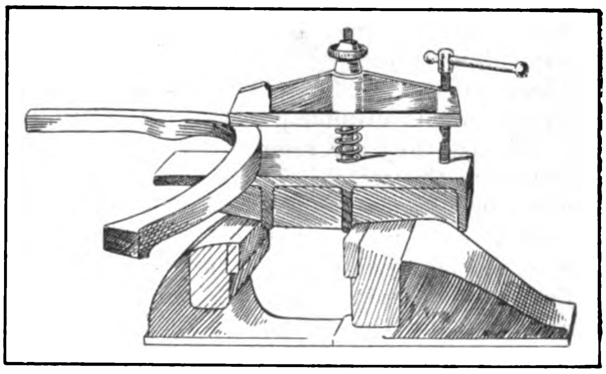
In handling lubricating oil it is important that the fluid be kept free from dirt or dust as the foreign elements act as an abrasive, cutting bearings. The Milwaukee Tank Works, Milwaukee, Wis., is manufacturing a lubricating oil cabinet which is constructed of heavy steel and to withstand severe service. It is provided with a pump of the self-measuring type and pints are handled as accurately as larger quantities. A quality claimed for it is that it will not drip. A lock and keys are fitted if desired. A measuring gauge indicates the quantity of oil on hand. The cabinets are made in barrel sizes, varying from one to five. The smallest member is 17 inches thick, 29 wide and 30 high, and weighs 185 pounds. All cabinets are guaranteed. Catalogue and price list will be forwarded upon application.

SEAMLESS STEEL TANKS.

With the very general adoption of compressed air in the garage and repair shop the use of a tank for storing the air is essential, especially when the compressor outfit does not include one of these members. Janney, Steinmetz & Co., Philadelphia, manufactures a wide variety of seamless tanks for various air installations, as well as for other uses. Catalogue and descriptive matter will be mailed free of charge upon request.

SHAW VISE FOR MACHINE WORK.

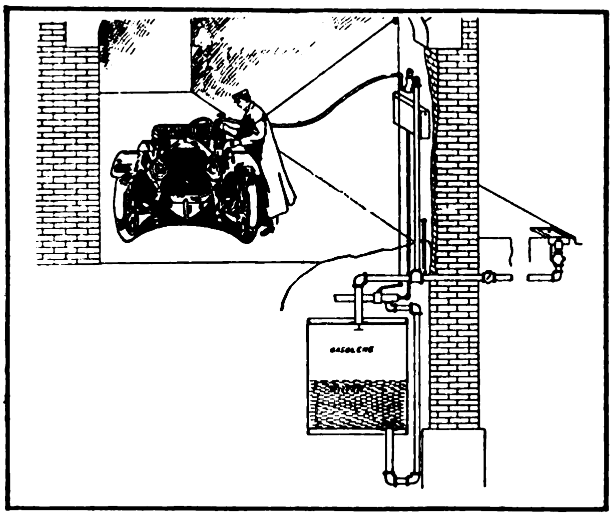
A vise that differs from conventional construction is the Shaw, brought out by an English concern and especially adapted to automobile work. It is a flat vise having a top and bottom grip, comprising a plate having a bolt let into it as shown in an accompanying illustration. A dog plate and a nut are fitted over the bolt member. This device is intended to be held in the jaws of an ordinary bench vise, either of the leg or parallel type, and small finished articles, such as bushings, terminals, small screws, nuts, etc., can be held and worked with ease.



The Shaw Flat Vise, Especially Adapted for Machined Work.

THE HYDRAULIC SYSTEM.

Among the factors of a gasoline storage system to be considered are: Freedom from evaporation, safety and economy of operation. A system presenting interesting features is the Hydraulic, manufactured by the Hydraulic Oil Storage Company, 90 West street, New York City. The principle involved is not new and as the name implies, water plays an important part. It is the difference between the weight of gasoline and water and the fact that these fluids will not mix, that govern the operation of the system.



Showing the Operation of the Hydraulic System and Its Components.

It comprises the storage tank to which is led the water, the fluid being piped to the lower part of the container. The supply or amount fed to the vessel is controlled by a water valve, which member closes the connection between the supply and the gasoline tank. When the lever of the water control valve is lifted, water enters the tank, lifting and forcing the fuel out through the draw-off pipe, thence to the gasoline tank of the car or other receptacle to be filled. A drain is provided for removing the water when the tank is to be refilled with gasoline and this member is automatic in its action, closing when fuel is being drawn from the large tank. The system is operated easily. To draw fuel the lever of the water control valve is lifted as shown in an accompanying illustration.

Clean gasoline is secured through all dirt and foreign elements dropping to the bottom of the tank, whence they are removed when the water is drained as the vessel is being refilled with fuel. The system permits of the use of all the fuel and the container is provided with a gauge member. One of the qualities emphasized by the design is that as the tank is always completely filled evaporation and the formation of combustible gases are prevented. Another feature of the system is that pumps are eliminated and that considerable time is saved as well as fuel.

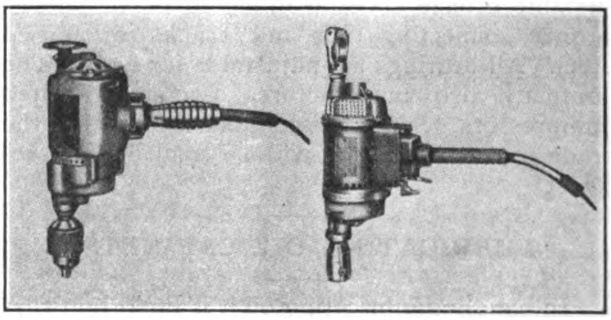
The Trident meter, utilized in connection with the system, is constructed in two forms, that illustrated being designed for garages, service stations, etc., and is particularly adaptable where a large number of cars is to be filled daily. The dial is placed vertically on the meter for convenience in reading and is large enough to be seen for a considerable distance. The main register is known as the straight reading and records continuously up to 100,000 gallons, after which amount is drawn the figures automatically return to zero.

An auxiliary or set-back register is provided, recording in parts of a gallon up to 10. It is so arranged that it can be set back to zero any time by simply turning the hand. For example: If five gallons are desired, when the large hand reaches five, that amount has been drawn. The large pointer can then be turned back to zero. The continuous register denotes the total amount regardless of the number of times this dial hand is utilized. The flow of the fuel after the desired amount is secured is automatically shut off. No gasoline can be drawn without its being recorded and the company holds that this feature enables a check to be kept upon the daily, weekly and monthly sales. Complete descriptive matter will be mailed upon request.

UNIVERSAL ELECTRIC DRILLS.

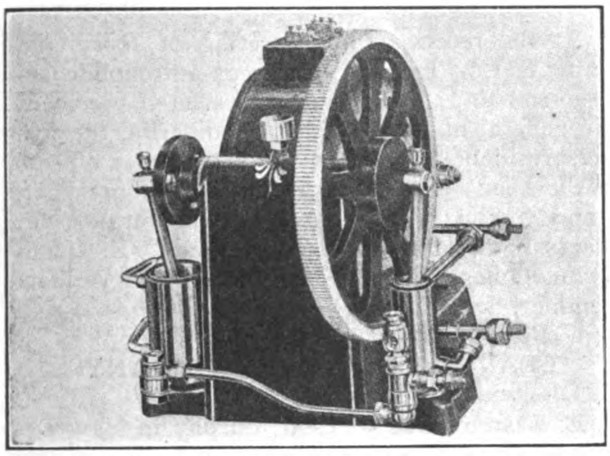
In equipping the repair shop with tools operated by electricity the current, whether direct or alternating, is considered. In the event of a workman being sent to a private garage to overhaul or complete some work on a machine which necessitates the use of a drill, for example, the shop tool may be a direct current instrument and the garage supplied with an alternating current.

The Chicago Pneumatic Tool Company, Chicago, is manufacturing what are termed universal electric drills capable of being operated on direct or alternating current and two types are presented in the accompanying illustration. That shown at the left has a .25-inch capacity for metal work. It is adapted for either 110 or 220 volts, and when operating at its maximum capacity the speed is 600 revolutions a minute. The equipment comprises a breast plate, chuck to take straight shank drills up to .25 inch diameter, and 10 feet of electrical conductor with an Edison connector. The drill weighs about seven pounds, is about 10 inches in height from breast plate to the end of the chuck, and consumes approximately 170 watts at full load.



Universal Electric Drills Operating on Direct or Alternating Current.

That shown at the right in the sketch is adapted for drilling holes in metal up to .5 inch and rotates at 450 revolutions a minute when operating at its maximum capacity. The equipment comprises a spade handle, No. 1 chuck, 10 feet of cord and fused connector, and two extra fuses. A breast plate is supplied in place of the spade handle if desired. The weight of the drill is 22 pounds and the shortest length from breast plate to end of chuck is 13 inches. The approximate energy consumption is 400 watts. It is designed for 110 or 220 volts.



Champion Automatic Compound Electric Air Pump Designed Especially for Garage Service.

AUTOMATIC ELECTRIC AIR PUMP.

A tank of compressed air for inflating tires and for utilization by the customer and workmen, is standard equipment with garages, service stations and tire repair firms. Many of the last named pipe the tank to the street for the benefit of their patrons and this arrangement makes it necessary that the compressor or pump operate automatically to replenish the supply of air whenever it becomes exhausted.

The Cleveland Faucet Company, Cleveland, O., is manufacturing an outfit especially designed for this work and in the accompanying illustration is shown the No. 6 Champion automatic compound electric air pump and automatic switch. It is held that the capacity of the pump is sufficient for the largest garage and that with an 18-gallon tank it will furnish enough air to inflate a large tire every minute and at any pressure. A constant pressure of 100 pounds or less is maintained automatically and the pump operates only when the supply of air is reduced.

The compound pumps are back geared direct to the electric motor, and are constructed entirely of bronze, with valves and connections of the same material. The pistons are water jacketed, maintaining a constant circulation of cool fluid, and a water tank is employed, eliminating the necessity of the continuous city supply. The water tank is substantially constructed and is located approximately 1.5 inches above the return connection.

The automatic switch controlling the pump is simple and the maker emphasizes its durability, also the fact that after installation the equipment requires no other attention than an occasional oiling. It is stated that the pump will automatically fill an 18-gallon air tank at the following pressures: Twenty-five pounds in three minutes, 50 pounds in eight minutes, 75 pounds in 12 minutes and 100 pounds in 16.5 minutes.

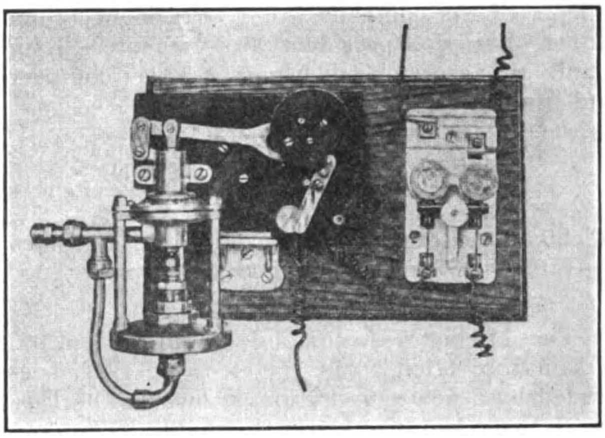
The specifications are as follows: Dimensions of pump, 15 inches wide, 19 inches deep and 18 inches high; switchboard, nine by 14 inches; diameter of large cylinders, 2.25 inches; small, 1.25 inches; stroke of piston, three inches; motor, alternating current, one-third horsepower; direct, .25 horsepower; revolutions, 150 a minute.

COES WRENCHES.

Strength without bulk or clumsiness is a desirable quality of wrenches for the repair shop and the tool must be capable of being handled easily and without bruising or slipping. The all-metal wrench has found favor among workmen owing to its ability to withstand severe usage. The Coes Wrench Company, Worcester, Mass., well known maker of this line, is issuing instructive literature concerning these tools which will be forwarded upon request.

ANNEALING STEEL.

The following formula for annealing steel is given by the D. T. Williams Valve Company, Cincinnati, O.: For small pieces of steel, take a piece of gas pipe two or three inches in diameter and put the pieces in it, first heating one end of the pipe and drawing it together, leaving the other end open to look into. When the pieces are a cherry red, cover the fire with sawdust, and leave the steel over night. A charcoal fire should be employed for this process of annealing.



Illustrating Automatic Switch Utilized with Champion Air Pump Outfit.

The commercial and good roads organizations of Colorado Springs, Col., have started a campaign to have the great ocean-to-ocean highway pass through Colorado.

ADDITION TO PILOT PLANT.

Increased Demand for Product Makes Necessary Securing Large Addition at Once.

The construction of a large addition to the plant of the Pilot Motor Car Company, Richmond, Ind., maker of Pilot cars, has been started and the company will soon be in a position to add to its production in a substantial manner. Large sales of the concern demanded that the capacity of the factory be increased, and according to President George Seidel of the Pilot company, its size will be trebled.

ANNOUNCES NEW DELIVERY CAR.

Baltimore Pleasure Vehicle Manufacturer to Add Commercial Line in Near Future.

Carl Spoerer's Sons Company, Baltimore, Md., maker of Spoerer pleasure cars, will market about May 1 a new 1500-pound delivery wagon, which has been designed by Engineer Morrow. The new wagon has a 30 horsepower, four-cylinder motor and a transmission affording four speeds forward and reverses. The company will continue the manufacture of pleasure cars and will probably enlarge its factory. The officials of the concern are Jacob Spoerer, Charles Spoerer, John F. Reus and B. J. Reus.

TO INCREASE ITS OUTPUT.

Lord Baltimore Truck Company Expected to Erect a Large Factory Building.

The Lord Baltimore Motor Car Company, Baltimore, Md., has announced its intention of greatly increasing its output of commercial vehicles during the present year and contemplates the erection of a large factory to produce and market the number of cars it has contracted for. The officers of the company are: President, John Luntz, Jr.; vice president and treasurer, John Luntz, Sr.; secretary, J. Elmer Stryker; engineer and designer, Otto R. Bieler.

NAMES CAUSE CONFUSION.

Michigan Automobile Company, Ltd., Becomes Fuller & Sons Manufacturing Company.

The Michigan Automobile Company, Ltd., Kalamazoo, Mich., was, on Dec. 31, 1912, succeeded by a new corporation, known as the Fuller & Sons Manufacturing Company. The concern has not made complete cars for a number of years and the recent incorporation of the Michigan Motor Car Company of the same city caused confusion, therefore it was thought desirable to change the name. The Fuller company makes a variety of parts and specializes in selective and planetary transmissions.

ACKERMAN IS PRESIDENT.

Prominent Detroit Accessory Maker Starts New Year Under Satisfactory Auspices.

At the recent annual meeting of Joseph N. Smith & Co., Detroit, maker of automobile accessories, E. L. Ackerman was elected president and general manager, C. E. Chamberlin, the former president, having retired. The other officers are: Vice president and factory manager, James Shand; secretary and treasurer, C. E. Blaesser; directors, E. L. Ackerman, C. E. Chamberlin, James Shand, C. E. Blaesser and William Lemmer, Sr.

LEAVES REO TRUCK COMPANY.

C. E. Easton Joins Gleeson Murphy in New Detroit Advertising Agency.

Charles E. Easton, formerly sales manager of the Reo Motor Truck Company, Lansing, Mich., maker of Reo trucks, has resigned his position to join the Detroit staff of the H. K. McCann Company, advertising agency, of which Gleeson Murphy, formerly with the General Motors Company, is the head. Mr. Easton assumes his new position well fortified with experience gained while occupying several important posts in the advertising field.

SEEKS ANOTHER BUILDING.

Sanford Motor Truck Company Is Preparing for Increased Business During 1913.

The Sanford Motor Truck Company, Syracuse, N. Y., maker of Sanford trucks, has purchased a three-story building of the Syracuse Savings bank and at least 300 trucks, it is expected, will be made this year, more than doubling the output of the plant. The company now has about 50 men on its payroll, but it is anticipated that before the end of the year between 200 and 300 will be employed.

EXTENDS BUSINESS FACILITIES.

Motor Accessories Mart in Chicago Adopts New Plan for Co-Operating with Manufacturers.

The Motor Accessories Mart, Chicago, has made a radical departure from its former line of business, extending its service and placing it on a more practical basis in an endeavor to make its quarters the common meeting place for western buyers and sellers. A salesroom has been opened, devoted exclusively to factory representatives and manufacturers' agents, to whom desk quarters are rented.

Stewart motor trucks, made by the Stewart Motor Corporation, Buffalo, N. Y., are now used as far north as Edmonton, Alberta, Canada, and as far south as Buenos Aires, Argentine.

TIRE PRODUCERS ADOPT NEW GUARANTEE.

DURING the progress of the recent New York show the Motor & Accessory Manufacturers adopted a new form of tire guarantee, the published wording of which is as follows:

> We guarantee all pneumatic motor car tires, bearing our name and serial number, to be free from imperfections in material and workmanship. Tires returned for consideration under this guarantee will be accepted only when all transportation charges are prepaid. If, upon examination, it is our judgment that tires are defective, they will be repaired or replaced at our option.
>
> When tires are replaced by us, charges will be made to owners at the time new tires are delivered, for such amounts as in our judgment will compensate for the service rendered by such replaced tires.
>
> Tires worn out in usual or unusual service, abused knowingly or unknowingly, misused, used on rims not bearing these stamps (———) injured through accident or design, are not covered by this guarantee.
>
> (Name of tire) pneumatic motor car tires are not guaranteed to give any definite miles of service, and any and all guarantees are expressly waived by any purchaser of these tires who uses therein any substitute for air; or who uses them under weights in excess of those for which the various tires are recommended, or who does not keep tires inflated to the pressure recommended by us.

Not all tire producers are members of the Motor & Accessory Manufacturers. Even among those who are members there does not appear to be an agreement with reference to the effect of the action taken. The Accessory and Garage Journal has asked leading makers their opinion concerning the new guarantee and its effect upon the tire industry. Some of these have responded as follows:

You have evidently confused the action of the tire makers in connection with not guaranteeing their tires when any substitute for air is used therein. There is just exactly as good and valuable a guarantee on tires today as there was one week ago. There has been absolutely no change in connection with same.

If you will read the advertising being run by most of the leading tire makers, you will find the guarantee in question therein, and it speaks for itself. It is simply a protective measure of tire makers to do away with the abuses that they have suffered under a guarantee by the use of injurious fillers and attachment of tires to rims not properly inspected, proving them to be suitable for use in connection with tires.

Yours truly,
B. F. GOODRICH COMPANY,
By H. E. RAYMOND, Second Vice President.
Akron, O., Feb. 3.

We do not believe in mileage guarantees for the reason that the properties entering into the use of a tire which determine the mileage that it ultimately gives are not only indefinite, but absolutely beyond the control of tire manufacturers, which necessitates the placing of a mileage guarantee so low to protect against the abused tire, that it is of little value to the careful user.

If a given quality of tire would give a uniform service in miles, a mileage guarantee would be advisable, but let us assume that there are 1000 tires exactly alike placed in service at the same time, the mileage that they give even in the event there are no accidents will vary in accordance with the individual conditions to which they are subjected—several hundred per cent.—which fact is unavoidable and makes impossible a rational mileage guarantee.

A guarantee coupled with the close price competition sets a wrong standard for the direction of the manufacturer's efforts. It offers an incentive to build a tire down in quality that it may be sold at a competitive price until with proper use it will just cover the mileage guarantee, rather than the proper incentive, which is the highest economy and the highest quality which it is physically possible to incorporate in an automobile tire.

Very truly yours,
KNIGHT TIRE & RUBBER COMPANY,
By O. HIBNER, Sales Manager.
Canton, O., Feb. 5.

We understand that this matter was taken up at a recent meeting of the tire manufacturers' section of the Motor & Accessory Manufacturers. We understand that the members present decided to withdraw from the custom which has heretofore prevailed of making adjustments upon a 3500-mile basis. We, however, do not expect to alter our present policy, as we are quite satisfied to maintain the guarantee of 4000 miles for our Vacuum Cup tires and 3500 miles for the plain tread tires.

While we are members of the Motor & Accessory Manufacturers, we are not compelled to adopt the policy which the majority has agreed upon.

Yours truly,
PENNSYLVANIA RUBBER COMPANY,
By H. W. DUPUY, President-Treasurer.
Jeannette, Penn., Feb. 3.

As we understand the guarantee adopted by the Motor & Accessory Manufacturers, each company is left free to make adjustments on such basis as it sees fit. The guarantee adopted is merely an ordinary commercial one. Any reputable manufacturer in any line usually stands ready to make good his product which is actually defective in material or workmanship. The trouble has been that the mileage guarantee on automobile tires has been abused by consumer and dealer alike. The experience of the larger tire companies in this connection has been somewhat expensive, so that it is not surprising that they should attempt to protect themselves against further loss.

Yours very truly,
MARATHON TIRE & RUBBER COMPANY.
By F. KESSER, Sales Manager.
Cuyahoga Falls, O., Feb. 13.

We wish to call your attention to the fact that there has been no change in the guarantee, with the exception that the guarantee does not apply, as in the case of our own tires, when any of the numerous substitutes for air are used, or when our pneumatic tires are applied to rims which do not bear the mark used for the protection mutually of ourselves, the car builder and the car owner.

There has evidently been a misunderstanding on the part of the car owning public as to mileage guarantee. While it is true that some tire manufacturers for their own convenience have taken in the abstract 3500 miles of service as a basis, there has been no guarantee that such a mileage would be given by the majority of manufacturers. It is true that one tire manufacturer openly advertises a guaranteed mileage of much greater than the above mentioned figure. That, however, is the individual policy of that concern, but speaking broadly, there has been no mileage guarantee on the majority of makes of tires, and the action taken was simply for the purpose of disabusing the minds of car owners of the misunderstanding existing on their part.

Yours very truly,
UNITED STATES TIRE COMPANY,
By J. D. ANDERSON, General Sales Manager.
New York City, Feb. 10.

We believe removing the mileage guarantee from pneumatic tires will be a good step in the right direction, as it will protect the manufacturer against misrepresentations which often occur. We believe it would help the user and operator of his car, and eventually mean that the manufacturer would produce a better tire.

Under present conditions it seems to be the aim of the manufacturer to produce a tire that will give a certain amount of mileage at a given value, where on the other hand a tire would have to be made that would stand on its merit alone.

Yours very truly,
FALLS RUBBER COMPANY,
By F. NOLTE, Secretary.

We have for the past eight years given a written guarantee for 5000 miles on Ajax tires and we shall continue to do so.

There is no denying that some of our users have taken advantage of us in making false claims of mileage obtained and thus securing adjustments which probably they may not have been justly entitled to. Yet our experience has convinced us that making a tire of the best materials, compounded scientifically and manufactured with the greatest of care, has justified the liberal guarantee that we have always offered.

Our determination to offer the highest quality tire manufactured, carries with it the further determination on our part to continue our written guarantee of 5000 miles, which accompanies every Ajax tire we sell.

Our claim for existence is quality and our proof of it is our guarantee.

Yours very truly,
AJAX-GRIEB RUBBER COMPANY,
By J. C. MATLACK, Secretary,
New York City, Feb. 17.

HONORS AUTOMOBILE INDUSTRY.

Selection of C. C. Hanch as Head of New Indianapolis Chamber of Commerce.

The election of C. C. Hanch, treasurer of the Nordyke & Marmon Company, Indianapolis, maker of Marmon cars, as the first president of the recently organized Indianapolis Chamber of Commerce, is not only an honor to himself, but to the entire automobile industry. The new association results from the consolidation of six of the commercial and civic bodies in the city.

Mr. Hanch is well known throughout the industry, aside from his connection with the Nordyke & Marmon Company. He is at present vice president and one of the directors of the Automobile Board of Trade and in addition he holds the important position of chairman of the patent committee. He formerly was vice president for Indiana in the National Association of American Manufacturers.

The new chamber of commerce will have charge of all public movements for the bettering of business, civic and social conditions in Indianapolis, and since motor car manufacturing plays such a prominent part in the industrial activity of that city it is eminently fitting that an automobile man should be selected for its first president.

C. C. Hanch, President, Indianapolis Chamber of Commerce.

NEW BOOK OF STANDARDS.

National Tube Company Presents Its 1913 Edition, Which Is Replete with Information.

The National Tube Company, Pittsburg, Penn., manufacturer of tubular goods, is publishing its 1913 edition book of standards containing 559 pages of information and engineering data upon tubing. Several pages are devoted to covering the main process of manufacturing both welded and seamless tubes, also threading, durability and physical properties of both National and Shelby seamless steel tubes. Those specialties of the last named design are described and illustrated and considerable space is given to tables dealing with this material.

The book is unusually replete with tables giving weights, dimensions, strengths, pressures, etc. Considerable attention is given to the mechanical properties of solid and tubular beams, notably those utilized in the motor car industry. Information in regard to water, gas and air is included, as well as tables of measures, etc. A glossary of terms used in the pipe and fitting trade is located in the back of the book. It is very compact, being four by 6.5 inches, printed on Canterbury Bible paper and retails for $2 the copy.

EXTENDS BUSINESS FACILITIES.

Motor Accessories Mart in Chicago Adopts New Plan for Co-Operating with Manufacturers.

The Motor Accessories Mart, Chicago, has made a radical departure from its former line of business and has greatly extended its service and placed it upon a more practical basis. It has opened a salesroom devoted exclusively to the accommodation of factory representatives and manufacturers' agents of automobile accessories, this being located adjacent to the New Southern hotel and to all of Chicago's accessory jobbers.

Ample desk quarters are being furnished to patrons, with heat, light, janitor, telephone and stenographic service and only representatives of reliable and diversified lines are being admitted. The firm endeavors to make its place the common meeting spot of western buyers and sellers. Further service is being rendered in the matter of receiving mail, telegrams, express, etc., to promote the interest of the patrons.

SPEEDWAY ON LONG ISLAND.

Association Incorporated in New York for Holding Automobile and Aeroplane Meetings.

The New York Motor Speedway Association, Inc., of New York City, has been incorporated under the laws of New York State, with a capital of $1,000,000, to hold aeroplane, automobile and motor vehicle races, contests and displays. The directors are: William B. Allen of Seattle, Wash.; Herbert J. Carter of New York City and Alfred B. Casner of Brooklyn, N. Y.

The association has closed a deal for a 650-acre tract of land at Garden City, L. I., which has for some time been used as an aviation field and about March 15 the construction of a two-mile track for automobile races will be begun. The association has a 10 years' lease of the property with the privilege of buying within two years after April 1. The promoters of the association say that for $200,000 they will be able to build the track and put up a grandstand with a capacity of 75,000 persons. There will be parking space for between 15,000 and 20,000 automobiles and it is probable that a long distance race will be held July 4. Another big meet is planned for the autumn, with weekly meets every Saturday during the summer similar to those held on the Brooklands track in England.

The aviation equipment now is under the control of the speedway association.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Maxim Tricar Manufacturing Corporation of Manhatton, New York City; $100,000; automobiles, Otto Kukneman, Charles F. Novothy, A. A. Meschutt.

Williamson Garage Company, Williamson, N. Y.; $20,000; to conduct garage; Alfred F. Raynor and others.

United Garage Company, New York City; $14,000; to operate garage; Samuel Ecker and others.

Suffolk Street Garage, Inc., Lynn, Mass.; $5000; Daniel Lynch, John Buckley, Henry Thomas.

Donovan Motor Car Company, Boston; $50,000; Joseph S. Donovan, A. D. Adams, G. E. Donovan.

Welch & Suthergreen Company, Fitchburg, Mass.; $30,000; to deal in motor cars; H. C. Mayo, E. J. Welch, F. E. Suthergreen.

J. D. Maxwell Motor Corporation, Tarrytown, N. Y.; $10,000; motor vehicles; Jonathan D. Maxwell, James P. McManus, Leander F. Sniffin.

S. J. Wise & Co., Inc., New York City; $20,000; motor vehicles; C. E. Van Vleck, E. M. Dalley, C. M. Kohn.

Bell & Waring Steam Vehicle Company, New York City; $25,000; automobiles; Harry G. Waring, Harvey W. Bell, Howard C. Phillips.

Glide Sales Company, Inc., Buffalo, N. Y.; $10,000; to deal in automobiles; J. Francis Lynch, Louis P. Fuhrmann, Edward T. Danahy.

National Welding Company, Jersey City, N. J.; $25,000; general automobile business and to weld, braze, repair and work with acetylene and oxygen; E. P. Hoyt, S. H. Culver, J. W. Phillips.

Durable Tread & Automobile Sales Company, New York City; $10,000; to deal in tires, tire treads and other accessories; Rose H. Pacobi, Samuel M. Winkler, Henry A. Deimel.

Buffalo Automobile Sales Corporation, Buffalo, N. Y.; $15,000; to manufacture and sell motors, engines, machines, etc.; William J. Harris, William U. Heverly, Maul MacDonald.

Mol Stringer's Garage Corporation, Brooklyn, N. Y.; $10,000; to deal in automobiles and conduct garage; Mol Stringer, James Culleeny, Frederick R. Huntington.

Maxton Auto Company, Maxton, N. C.; $50,000; to deal in and make automobiles; A. J. McKinnon, R. M. Williams, Byron McCallum, Ernest Williams.

Pratt-Hendricks Company, Brooklyn, N. Y.; $1000; to deal in automobiles; William H. Pratt, William J. Hendricks, George L. Robinson.

Miller Tire Sales Company, New York City; $5000; to deal in automobile tires; Harry C. Miller, Harrison C. Mills, Warren A. Schenck.

Co-Operative Used Car Company, New York City; $3000; to deal in automobiles; Joseph B. Bauer, Louis Ezechiel, John Curtis.

Gas Saver Sales Company, New York City; $25,000; to manufacture motor car devices; H. Clarence Fisher, John H. Miller, Eugene Cable.

Auto Buyers' Company of America, Inc., New York City; $1000; to deal in motor cars; Julius Lichtenstein, John P. McClellan, Arthur A. Hill.

Hoyt Garage, Inc., Brooklyn, N. Y.; $1000; to operate garage; Louis C. Brooks, Walter J. Kelly, Charles Blaken.

R. & R. Garage Company, Lansing, Mich.; $5000; to operate garage; E. A. Rounds and others.

D. & H. Auto Company, Kingston, Penn.; $25,000; to deal in electric, steam and gasoline vehicles; John M. Deatrick, J. G. Harris, Lester Harris.

Veerac Motor Truck Company, Inc., New York City; $10,000; Edward L. Whittemore, Harry B. McGinley, George H. Hinnau, 165 Broadway.

Pennypacker Engine Starter Company, Los Angeles, Cal.; $150,000; F. D. Webb, F. C. Morgan, E. J. Pennypacker.

Lathan Auto Supply Company, San Francisco, Cal.; $25,000; J. E. Lathan, A. Lathan, A. S. Lathan.

The Charles S. Johnson Company, New Haven, Conn.; $150,000; to sell automobiles and parts; C. S. Johnson, George D. Atwood, Clarence R. Hooker.

Brown Car Corporation, New York City; $30,000; to manufacture and sell motors, etc.; W. P. Fargo, H. W. Torney, E. E. Beyer.

Chrome Manufacturing Company, Inc., New York City; $25,000; vehicles of all kinds; James E. Marshall and others.

Motor Car Service Station Company, Cleveland, O.; $10,000; to repair automobiles and operate storage business; Paul S. Knight, M. Marquard, D. C. Mills, M. W. Spear, W. P. Godfrey.

Sin-Ti Rubber Company, Washington, D. C.; $25,000; to manufacture automobile accessories, compounds of rubber, etc.; B. R. Walters, J. C. Young, Sidney E. Kent, John Tyscowski, Roswell W. Snow.

Standard Shock Absorber Company, Cleveland, O.; $100,000; to manufacture and deal in shock absorbers; C. D. Sword, William Leary, G. D. Sword, Naomi M. Leary, G. A. McGill.

Logan Square Auto Supply Company, Springfield, Ill.; $10,000; to manufacture automobile supplies; Otto E. Schmidt, August J. Schmidt, Martha Perl.

Rayfield Motor Sales Company of Illinois, Chicago; $41,000; automobiles and accessories; Robert C. Wheeler, Charles L. Cobb, Cecil Barnes.

Tidewater Automobile Association, Inc., Norfolk, Va.; $15,000; D. P. Paul, C. L. Young, M. Levy, J. K. Water.

International Automobile Supply Company, Chicago; $5000; to manufacture and deal in automobile supplies; William L. Loettel, Mark T. Adams, William E. Stephens.

Maitland Rubber Company, Springfield, O.; $10,000; to manufacture rubber and deal in rubber goods, tires, etc.; Frank R. Talbott, Cora P. Coltwell, Frank P. Patrick, Garnett W. Brand, Henry H. Durr.

Simplex Vehicle & Gear Company, Indianapolis, Ind.; $15,000; to manufacture motor car parts; S. S. Helms, Theodore Sanstro, Maurice M. Kiefer.

Quartette Automobile Signal Company, Los Angeles, Cal.; $100,000; E. E. Peck, F. M. Hand, W. L. Clark.

Invincible Tire Company, Providence, R. I.; $25,000; to manufacture and repair rubber tires; Charles H. Graves, Percy W. Gardner, Harold R. Curtis.

Fox-Shyrock Auto Company, Fort Wayne, Ind.; $10,000; automobile sales; Bartlett W. Shyrock, William W. Shyrock, George T. Fox.

Accessories Sales Company, New York City; $50,000; to manufacture and deal in automobiles and accessories; James R. Howe, Jr., Charles Hyman, Forrester A. Gin.

Dayton Top Improvement Company, Dayton, O.; $10,000; R. J. Cantelon, H. E. Randall, William M. Matthews.

Stewart-Toozer Motor Car Company, Omaha, Neb.; $25,000; automobiles and supplies; J. T. Stewart, G. E. Toozer.

Acme Electric Auto Works, Los Angeles, Cal.; $10,000; F. W. Jackman, E. E. Mason, F. C. Morgan.

Eclipse Wheel Company, Camden, N. J.; $300,000; wheels of all kinds for automobiles and wagons; F. R. Hansell, J. A. MacPeak, G. H. R. Martin.

Hamilton Taxicab Company, Hamilton, O.; $5000; J. A. Weigel, Cora A. Weigel, George J. Kalbeir, Louise E. Weigel, Caroline Weigel.

Federation Supply Company, Inc., Oneida, N. Y.; $50,000; automobile exchange; Albert J. Seaton, Timothy Curtin, Howard D. Crim.

Texas Motorway Company of Dallas, Dallas, Tex.; $10,000; to construct private grade, macadamized roadway, 500 miles; G. W. Baker, John B. Christenson, G. L. Cade.

Keystone Motor Supply Company, Pittsburg, Penn.; $12,000; to manufacture, sell, trade and repair motor cars; incorporators, R. V. Campbell, C. H. McDonald, E. H. Biedringhas.

Auto Adjunct Company, Melrose, Mass.; $50,000; incorporators, J. E. Knapp, A. W. Eldredge, E. J. Sanderson.

Universal Truck Company of New England, Boston; $25,000; incorporators, M. Meyers, M. E. Crable, F. L. Hewitt.

Sterling Automobile Company, Mercedes, Hidalgo County, Tex.; $10,000; incorporators, A. G. Crawford, W. D. Chadick, G. E. Simpson.

Ohio Auto Carriage Company, Cleveland, O.; $10,000; incorporators, Alfred A. Bensch, Ralph Goldsworthy, F. A. Federman.

F. P. Miller Motors Corporation, Utica, N. Y.; $5000; incorporators, Henry R. Beebe, William T. Cantwell, Arthur F. Fenner, T. Harvey Ferris, F. P. Miller.

K-W Garage, Inc., South Orange, N. J.; $25,000; general automobile business; incorporators, G. E. Krug, T. R. Were, C. L. Krug.

Gildale Motor Corporation, New York City; to deal in automobiles, etc.; $30,000; incorporators, F. W. Strauch, T. P. Gilman, Jr., E. S. Peck.

United States Tire Filler Company, Camden, N. J.; $125,000; automobiles, tires, etc.; incorporators, R. B. Patton, H. E. Patton, H. R. Gorman.

Autovend Machine Corporation, New York City; $300,000; to deal in automobiles; incorporators, E. Wrigley, A. H. Fenton, C. M. Van Deusen.

Kitto Garage, Muskogee, Okla.; $1000; incorporators, A. L. Kitto, Harry Kitto, S. V. Kitto.

Mohawk Rubber Company, Akron, O.; $350,000; to manufacture rubber goods; incorporators, R. M. Pillmore, J. K. Williams, S. S. Miller.

F. A. M. Auto Supply Company, Buffalo, N. Y.; $20,000; to deal in motor car supplies; incorporators, Frank A. Marburg, John B. Green, Richard H. Templeton.

Alco Motor Supply Company, Cleveland, O.; $10,000; to deal in motor car supplies; incorporators, M. Kluger, C. K. Halle, Frank Butler.

S. & M. Tire & Rubber Company, Akron, O.; $20,000; to deal in automobile tires; incorporators, Alois Michler, Erwin S. Kintz, Charles M. Smith.

Peterman Garage Company, Jamestown, N. Y.; $5000; to operate garage; incorporators, Otto G. Peterman, August Peterman, Myrtle S. Peterman.

Machinery & Motor Company, Quincy, Ill.; $25,000; to operate automobile repair shop; incorporators, F. H. Wilms, B. Kinsey, H. V. C. Tingley.

Ray Harroun Company, Indianapolis, Ind.; $50,000; to deal in motor cars; incorporators, Ray W. Harroun, L. R. Townsley, U. G. Baker.

Model Garage Company, Cincinnati, O.; $10,000; to operate garage; incorporators, Edward Hine, Martin Fette, Carl Reichelman, Clara Heine, Della Cottrell.

Harbor Garage & Machine Company, Indiana Harbor, Ind.; $7500; to operate garage and repair shop; incorporators, Gustave Jernberg, August Jernberg, Charles Saluski.

Park Motors Company, Columbus, O.; $30,000; to deal in automobiles; incorporators, Scott Van Etten, Charles Parkison, A. Van Etten.

Automobile Clearing House Company, Cincinnati, O.; $2500; to deal in motor cars; incorporators, Thomas A. Reilly, Edwin P. Bernardi, Samuel D. Bromley.

Detroit Flash Curtain Company, Detroit; $25,000; to manufacture motor car curtains; incorporators, Fred J. Schaffer, William H. Goodfellow, Harry M. Vaughn.

The Twin City Motor Car Company has been incorporated at Lemon, S. D., with a capital of $60,000 and P. J. Kalman is president. Distributing stores will be established at St. Paul and Minneapolis, Minn. The company has the exclusive agencies for the Flanders electric cars, and the Sauer and Mack trucks for Minnesota, North Dakota and South Dakota.

WITH THE MANUFACTURER

R. M. Hawkins, formerly assistant purchasing agent of the Standard Welding Company, Cleveland, O., maker of Stanweld rims, etc., has resigned his position.

The Pierce-Arrow Motor Car Company, Buffalo, N. Y., maker of Pierce-Arrow cars, announces that the Iowa Auto & Tire Company, Davenport, Ia., which handled the company's product at Davenport up to 1911, no longer represents the company, the present distributor being the Mason Carriage Works of that city.

The Bosch Magneto Company, New York City, announces the appointment of the following new distributors: Doubleday-Hill Electric Company, 719-721 Liberty avenue, Pittsburg, Penn.; Motor Parts Company, 185-187 Columbus avenue, Boston, Mass.; Phoenix Automobile Supply Company, 3974-76 Olive street, St. Louis, Mo.

The Packard Motor Car Company, Detroit, maker of Packard cars, has purchased a plot of land at Locust and 22d streets, St. Louis, Mo., through its local agent, the Halsey Automobile Company. It is understood to be intended for service station purposes.

C. Robert Hoyme, prominent on the Philadelphia automobile row for seven years, has been appointed manager of the Alco branch in that city by the American Locomotive Company, New York City, maker of Alco trucks and pleasure cars. Mr. Hoyme previously was sales manager of the International Motor Company's branches at Philadelphia, Baltimore and Washington, and before that was associated with the Autocar Company, Ardmore, Penn., maker of the Autocar line.

Forrest M. Keeton, president of the Keeton Motor Company, Detroit, maker of Keeton machines, announces the appointment of P. L. Lovelace as foreman of the painting department and John Andre as foreman of the trimming department. Both formerly held similar positions with the Packard Motor Car Company, Detroit, maker of Packard cars.

The Kelly-Springfield Motor Truck Company, Springfield, O., has moved its New York City branch to 239-241 West 56th street, where it is in charge of A. S. Holly.

The Cataract Rubber Company, Boston, Mass., maker of Cataract tires, intends soon to open a branch at New York City. The branch recently established at Providence, R. I., to handle all of the Rhode Island business, was the third step in the company's plan to cover the country with distributing stations for its product.

Edward J. Samuels, who has been head of the publicity department of the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, has gone to London, England, where he will take up the same line of work for this company. Mr. Samuels has been very successful in this country and the Goodyear executives expect excellent results in his new field.

R. Cairncross Campbell, former manager of the Adams Bagnall Company, Philadelphia, sailed for London recently to become assistant manager to F. S. Bennett of the Buick and Oakland branch of the General Motors Export Company.

D. F. Kalish, general manager of the Hartford Auto Parts Company, Hartford, Conn., for the past four years, has resigned to enter a new field of business.

The Findeisen & Kropf Manufacturing Company, 21st and Rockwell streets, Chicago, maker of Rayfield carburetors, has established new branches at 1140 Michigan boulevard, Chicago; 1902 Broadway, New York City and 997 Woodward avenue, Detroit, Mich.

The Dyneto Electric Company, which manufactures automobile starting and lighting devices at Elbridge, N. Y., has increased its capital stock to $200,000. It is said the company plans to establish a plant at Syracuse, N. Y., and another at Detroit.

The Niagara Gasoline Motor Company, Dunkirk, N. Y., which is planning to organize with a capital of $50,000, has a new motor plant now in course of completion at Dunkirk.

The Empire Auto Top Company, Philadelphia, Penn., maker of automobile tops and trimmings at 207 North 22d street, is planning to erect a modern factory building to be equipped with modern machinery.

The Electric Auto Lite Company, Toledo, O., is building an addition to its plant at 133 Michigan street. The concern manufactures a new combined electric lighting and starting system for motor car equipment.

The Keystone Spring Works, 1313 Buttonwood street, Philadelphia, Penn., maker of motor truck springs, has enlarged its building because of the increase of business which necessitated more space.

J. G. Cleary of Milwaukee, Wis., has purchased the plant of the Findlay Motor Company, Findlay, O. The purchase price is said to have been $50,000 and the machinery will be moved to Milwaukee, according to the announcement.

The Kernodle-McDaniel Company, Frankfort, Ind., maker of Easy starter and speeder, has sold its rights in that invention to the Logan Auto Supply Company, Logansport, Ind. The former company will devote its entire time to the manufacture of a small device that it is claimed will save the automobile owner money on the consumption of gasoline.

The Auto Tire Filling Company, 1422 Fairmount avenue, Philadelphia, Penn., has leased the entire building at 1722 Fairmount avenue, to be used in addition to the old establishment.

The Auto Products Company of America, St. Louis, Mo., has been incorporated with a fully paid capital of $25,000 with offices at St. Louis, to manufacture Punch's original Nu-Tire and other automobile specialties, such as cement, body paints, polishes, etc. Following are the officers of the company: President, J. C. Punch; vice president, S. C. Punch; treasurer, William Grafeman; secretary, D. T. Punch.

The Peerless Motor Car Company, Cleveland, O., maker of Peerless pleasure and commercial vehicles, announces the appointment of E. J. Kulas as general sales manager. Mr. Kulas has had wide experience in that field.

The Swinehart Tire & Rubber Company, Akron, O., maker of Swinehart tires, announces it has begun the erection of new buildings and the installation of new machinery to provide for a greatly increased output this year.

The Russell M. Seeds Company, Indianapolis, Ind., a well known advertising agency in that city, has removed to more commodious quarters in the Central Union Telephone building, New York and Meridian streets. Rooms 402-417 are being occupied with general entrance at 403.

The Federal Rubber Manufacturing Company, Milwaukee, Wis., has established a factory branch at 361 Golden Gate avenue, San Francisco, and patrons of the company will be given first class service. E. L. Rettig, Pacific Coast manager of the company, is in charge.

The Ernest Lee Machine Company, Cleveland, O., manufacturer of automobile accessories, has plans for the erection of a new factory to cost about $15,000.

J. W. Mount & Co., Red Bank, N. J., maker of automobile bodies, is having a large addition erected to its factory, at the corner of Maple avenue. This is expected to care for the large growth of business which the firm has enjoyed during the last few months.

E. F. Howell is in charge of the new factory branch established by the Chase Motor Truck Company, Syracuse, N. Y., maker of Chase trucks, at 3607 Lancaster avenue, Philadelphia, Penn.

The McNaul Auto Tire Company, Toledo, O., has moved into the three-story building on Superior street and the entire structure will be remodelled to facilitate the manufacture of a tire with an extra heavy tread.

The Moore Truck & Manufacturing Company has been formed at Detroit and will locate in the Debo building on First street. The company will manufacture the Moore patent barrel truck.

The Abendroth & Root Manufacturing Company, Newburg, N. Y., maker of motor trucks, has opened a branch factory and salesroom at 237 Halsey street, Newark, N. J. A. C. Bogardus of Montclair, N. J., is manager of the plant.

The Universal Motor Truck Company, Cleveland, O., is a strong addition to the automobile houses of that city. The sales and service departments are located at 2352 Euclid avenue. C. W. Moody is general manager and M. J. O'Connor and J. A. Boyd will have charge of the sales department.

W. P. Dean has formed the Keeton Motor Company of New England to distribute throughout that territory the product of the Keeton Motor Company, Detroit. Mr. Dean was manager of the Detroit branch of the Olds Motor Works, Lansing, Mich., maker of Oldsmobiles, from 1908 to 1911. He has already placed agencies for Keeton cars at Bridgeport and Hartford, Conn.; Providence, R. I.; Worcester, Mass., and other cities.

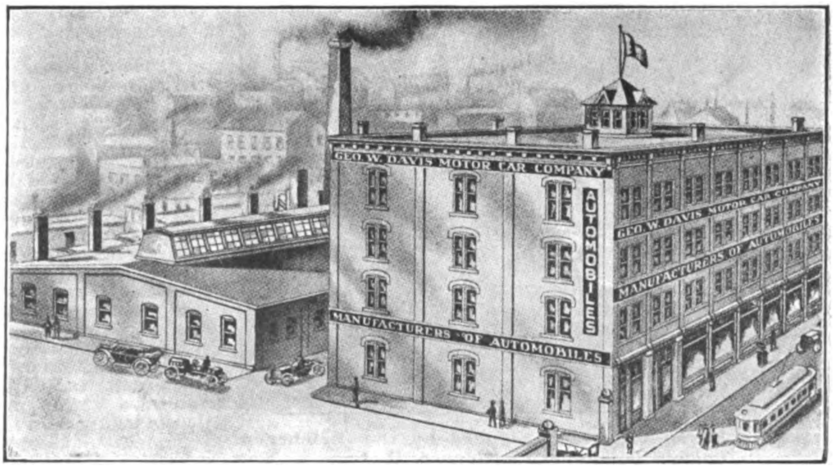
The Marathon Motor Works, Nashville, Tenn., maker of Marathon cars, has plans under way for one of the finest club buildings in the south. It will be used expressly for the employees of the plant and will have all the conveniences of the best clubrooms in the city. Among the many attractive features offered will be a well-equipped gymnasium, a large concrete swimming pool, tub and shower baths, billiard room, large parlor, library room with a liberal supply of the best and latest books and magazines, and a spacious ball room that may be converted into a banquet hall when occasion demands.

The Kelly-Springfield Motor Truck Company, Springfield, O., maker of Kelly-Springfield trucks, has announced the appointment of Henry Schmidt as manager of its new branch at Seattle, Wash. Mr. Schmidt was formerly connected with the Packard selling organization at Seattle for a number of years.

Charles Drum, connected until recently with the production department of the Packard Motor Company, Detroit, maker of Packard trucks and pleasure cars, has become production manager of the Keeton Motor Company, Detroit, maker of Keeton cars.

The Findeisen & Kropf Manufacturing Company, Chicago, maker of Rayfield carburetors, recently held the annual meeting and booster dinner of its sales and service departments at the New Southern hotel, Chicago. Carburetion in all its phases was discussed and much enthusiasm for Rayfield success was demonstrated.

The George W. Davis Motor Car Company, Richmond, Ind., is well equipped for the manufacture of the Davis car, which was displayed for the first time in the East at the recent New York show. An accompanying illustration presents the plant, which is modern in every particular, being equipped with all the latest devices known to the science of metallurgy. Men of national reputation in the industry are in charge of the production of the Davis automobiles, insuring a high class product.



Factory of George W. Davis Motor Car Company, Richmond, Ind.

The McVey Manufacturing Company, Dayton, O., maker of automobile accessories, with a capital stock of $60,000, is planning to enlarge its factory.

GARAGE & DEALER

The Van Winkle Motor Truck Company, Atlanta, Ga., has opened a factory sales office and service branch at 39 Houston street. I. B. Lawton is general sales manager.

F. W. Ramm & Sons, operating a garage at St. Petersburg, Fla., has decided to incorporate in order that a larger and more complete establishment can be maintained to care for increasing business. The capital will be $100,000 and many of the leading business men of the South have taken stock.

The Southwick Auto Supply Company, Topeka, Kan., has moved to new quarters at 925 Kansas avenue.

The Michigan Motor Sales Company, Madison, N. J., recently incorporated with capital stock of $10,000, has taken headquarters at 311 Halsey street and will deal in motor vehicles and conduct a repair shop. Elmer L. Reynolds is president of the company.

The Belcher & Loomis Company, 89 Weybosset street, Providence, R. I., is admirably located in the centre of the city, where it maintains a general agency for a wide variety of automobile accessories and supplies. Inasmuch as the store is on the direct line of travel for visiting motorists there is abundant reason for calling attention to the products handled by the concern in attractive window displays. An accompanying illustration presents the manner in which this important feature of the business is conducted.

Joseph A. Hill and Charles L. Vermylea of Catskill, N. Y., have leased a building on West Bridge street which will be entirely remodelled for a first class garage to be operated as the Peerless Garage Company.

James W. Stockard and J. B. Church, managers of the International Auto Company, El Paso, Tex., are having a new building erected on Campbell street, in which they will handle automobiles and accessories.

A. Spencer Wright has opened a first class garage on Prospect street, Oneonta, N. Y. A large workroom for repairing is located in the rear.

Weaver & Wittle, Lebanon, Penn., have opened a first class garage and machine shop in Walnut alley. In addition a repair shop will be operated.

The Ozark Motor Company, Springfield, Mo., has been incorporated with a capital stock of $5000 and will be located at 231 South Jefferson street.

The St. Joseph Automobile Company, St. Joseph, Mo., of which Louis M. Pierce and C. W. Davis are the managers, will occupy and maintain a large modern garage on Ship street, for which a building was recently erected.

The Pugh Motor Car Company, Kingston, Penn., has leased its garage to W. B. Buckley and H. E. Drews, who will in the future conduct the business at 592-594 Market street under the style of the Kingston Motor Car Company.

The City Garage, Norfolk, Va., has installed a vulcanizing plant and in addition will handle the Thermoid Rubber Company's Nassau tires.

C. W. Moody, formerly with the Nyberg Automobile Works, Anderson, Ind., maker of Nyberg cars, and John Clark, formerly superintendent for the company, will open a new garage in the Zeigler building at Anderson.

The Oklah Garage has been moved from its present quarters at 313 to 317 Keeler avenue, Bartlesville, Okla., and the garage feature will be discontinued. Instead a supply store will be opened, equipped with automobile parts and several good makes of cars will be handled.

Dayre Courtney has opened a garage and automobile supply house on Main street, New London, Ia. He will handle several makes of cars and carry a full line of automobile accessories.

Frank Cook of Lakewood, N. J., has taken over the garage in that place formerly operated by the McCue & Beecroft Company. He will handle all kinds of automobile supplies.

Jones & Williams, owner of the Beaumont Garage & Machine Company, Beaumont, Cal., is erecting a new garage on D street, which is nearly ready for occupancy.

The Warner Automobile Company, Watertown, N. Y., has sold its entire interests at 155 Arsenal street to Perl W. DeVendorf. Mr. DeVendorf has secured the agency for the Ford cars, made by the Ford Motor Company, Detroit.

The Mt. Pleasant Garage, Harrisburg, Penn., recently known as the Broadway garage and located at 1358 Thompson street, has changed hands and will resume its former name.

The Colonial Motor Company, Baltimore, Md., distributor for Studebaker cars and Universal trucks, has opened a new fireproof garage on North avenue.

The Morristown Auto Company, Morristown, N. J., recently incorporated with capital stock of $25,000, has located its office at 34 Pine street, with A. Newmark in charge as manager.

The J. S. Hoffman Motor Car Company, Sharon, Penn., has occupied a new garage recently erected at the corner of Vine street. The Chalmers and Overland cars will be handled.

The Modern Garage Company, Titusville, Penn., will soon occupy a new garage, which is now in course of completion on Central avenue.

The Anderson Automobile Company, Lancaster, O., located in the Keller building, is making improvements to its garage.

The Herring Motor Company, Des Moines, Ia., has moved into its new building on West 10th street, which was recently erected at a cost of $100,000. The company is wholesale jobber of automobile accessories and supplies.

Samuel A. Yout, Little Rock, Ark., has purchased the automobile business formerly conducted by the Reinman & Wolfory Auto Company of that city, and will operate it under the name of Arkansas Auto Exchange. The garage on Third street will be remodelled.

Walter Miller has opened a new garage on Broadway, Davenport, Ia. A complete repair shop has been installed and Mr. Miller will do all kinds of automobile, motorcycle and bicycle repairing.

C. O. Donner, Alexandria, Minn., has purchased the entire stock in the Alexandria Auto Company, held by his partner, J. A. Bailey, and will continue the business under its original name.

Donald MacFarlane, who conducts an automobile repair business at Berkeley, Cal., has been forced to enlarge his plant because of additional business.

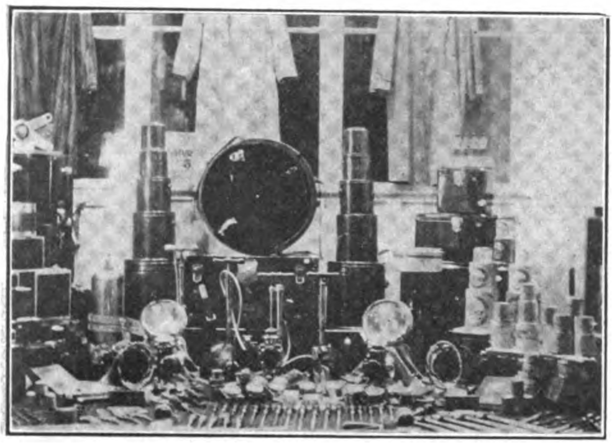
The Two Republics Garage, Texas street, El Paso, Tex., is being enlarged by the erection of a substantial addition.

Newton B. Smith of New Brunswick, N. J., has opened a new garage in that city at 222 Nelson street. He will do repair work of all kinds and handle the Marion and Studebaker cars.

The Sims Automobile Company, Grand Forks, N. D., has opened a garage at Park River, with Clement Woods, formerly of Grafton, in charge as manager.

The R. M. Allen Motor Sales Company, 1924 Euclid avenue, Cleveland, O., has been formed to handle the Velie and Paige lines.

The Birmingham Motor Company, Birmingham, Ala., will soon occupy a new garage on Avenue C, which will be equipped with a modern repair shop.



Attractive Show Window Arranged by the Belcher & Loomis Company, Providence, R. I.

The Keystone Garage Company, Altoona, Penn., has opened an up-to-date garage on 11th avenue. A repair shop also has been installed.

The Elgin Motor Company, Elgin, Ill., has been formed to conduct a modern garage, supply house and automobile agency and has located on Spring and Milwaukee streets. The agency for several well known makes of cars has been secured.

Albert Rhyan and Arthur Carbary of Lafayette, Ind., have opened a new garage and repair shop at South and Main streets, to be known as the Oakland garage.

The Boyett-Brannon Tractor Company, 70 South Forsythe street, Atlanta, Ga., announces that it will for the present manufacture its motor tractors by contract.

The Hanover Garage on Abbottstown street, Hanover, Penn., will soon be enlarged, the business having greatly increased under the management of Robert E. Spangler.

The Southern Auto & Equipment Company, Atlanta, Ga., has established a business at 94 South Forsythe street. In addition to doing repair work a full line of supplies and accessories will be carried.

The Steinbach Company, Asbury Park, N. J., is erecting a garage adjoining its present establishment on Bangs avenue. The company handles the Mack and Flanders vehicles.

The Rustling Stone Company, Irvington, N. J., has erected a new garage at 152 Shaw avenue, equipped with modern appliances.

The A. P. Tire & Vulcanizing Company, Asheville, N. C., has established business in the Arbogast Motor Company's building on North Main street. The company will deal in automobile tires and rubber goods and has also installed a rectifying apparatus for charging storage batteries.

The Adams Garage, 306 Franklin street, Natchez, Miss., has been sold to the Motor Repair Exchange and the business will be merged and conducted at the same address.

The Streaker Implement Company, Bellevue, O., has taken the agency for Studebaker cars, made by the Studebaker Corporation, Detroit, Mich., and will remodel the building on West Main street.

Dr. H. A. Davis has sold his interest in the Dickinson Motor Car Company, Dickinson, N. D., and that concern is now under the management of Wilcox & Clark.

The Dell Rapids Auto & Supply Company, Dell Rapids, S. D., has outgrown its plant and is building extensive additions.

The Stewart Automobile Company, 231 West 54th street, New York City, has taken the agency for the Pullman cars, made by the Pullman Motor Car Company, York, Penn. A service station has been established and all parts of the Pullman machines are carried in stock.

The Abbott Motor Sales Company, Toledo, O., of which L. E. Barger is manager, has made arrangements to occupy its new building at Madison avenue and 15th street. Its former quarters were at 623 Madison avenue.

The Central Garage, recently established by Frank Cliber and Andrew Stone, Jr., at Holidaysburg, Penn., has been opened to the public and is enjoying generous patronage. The garage is modern in all particulars and the structure is fireproof.

J. S. Brown, Redlands, Cal., has begun the erection of a new garage and machine shop at 346 Orange street, to be known as the Continental garage. Several popular makes of cars will be handled.

The American Taxicab Company, Reading, Penn., has moved from 112 North Eighth street to 730 Court street, where it will occupy three floors. A fully equipped machine shop has been established.

The East Side Garage Company has been formed at Altoona, Penn., and has opened a temporary garage on Ninth street. The company will erect a large, modern building on Greene street.

Edward Bell and William Ducharme, Marquette, Mich., will open a new garage on Spring street, which will be equipped with a first class repair shop.

H. A. Gunderson, Escanaba, Mich., has moved to 303 Ludington street, where he has opened a modern garage.

The G. H. Hafemeister Motor Company, Watertown, Wis., recently purchased the A. E. Puerner garage at Ft. Atkinson, and took immediate possession. Max Lounsbury is in charge of the business.

The Boone Automobile Company, Boone, Ia., has started work on the erection of a large addition to its plant, to accommdate increasing business.

G. H. Decker, who conducts a modern garage at 3828 Hudson boulevard, Hoboken, N. J., is planning enlargements to his building.

The Geneva Automobile Company, Geneva, N. Y., is erecting a large addition to its garage on Main street to care for increasing business.

The Clifton Garage, Union, N. J., is making extensive improvements to its plant at Third street and Union Hill.

The Craig-Centre Auto Company, Pittsburg, Penn., has secured additional property at Craig street and will erect new buildings in the near future.

Dunkelberger & Lesher is the name of a new firm at Kutztown, Penn., for which a new garage has been erected. In addition to repair work the company handles the Ford cars, made by the Ford Motor Company, Detroit.

The Quincy Motor Company, Quincy, Ill., has occupied its new, modern repair shop at 716 York street, and is now prepared to handle all kinds of motor car work.

The Oriental Rubber and Supply Company, Brooklyn, N. Y., has moved from its former location on Bedford avenue to the corner store in the Tollner block, Bedford avenue and Madison street. The company carries a full line of Federal tires and motor requisites.

The Longstreet Motor Car Company, Philadelphia, has moved into larger quarters at 2126 Market street, to secure necessary space for increasing business.

The Wright-Callender-Andrews Company, Los Angeles, Cal., has leased the new modern garage to be erected at 1323 South Flower street by Miss L. R. Hawks, at a cost of $60,000.

O. B. Jones, San Bernardino, Cal., has purchased the interest of Dr. H. W. Hall in the garage business of Heintz & Hall on F street and the business will be continued on a larger scale by Heintz & Jones.

Stils & Graessle, Nashville, Tenn., is remodelling its old carriage factory into a modern garage, which will contain a first class repair department. The firm will also handle the Haynes cars, made by the Haynes Automobile Company, Kokomo, Ind.

The New DeBord McGregor Garage, recently established at Stillwater, Okla., has been opened to the public and is enjoying a good patronage. Herbert Ricker is in charge.

The Green Motor Car Company, Newark, N. J., is soon to start work on the erection of an extension to its garage on Washington street, which will involve an expenditure in the neighborhood of $12,000. Plans for the addition have been completed.

J. A. Hopson, New Haven, Conn., has purchased the former Yale field garage at 111-113 Derby avenue, now known as the J. A. Hopson garage. A corps of expert workmen are employed to attend to all kinds of repair work. Mr. Hopson was connected with the Olds Motor Works at Lansing, Mich., for six years, and for three years he was the company's factory expert in the New England territory.

The White Pole Garage, Anita, Ia., has moved into its new building on the south side of West Main street.

T. Chatfield of Chicago has received a permit to erect a one-story garage at 617-625 Waveland avenue. The building will be of brick and will cost $25,000.

Charles Pendleton, Keota, Ia., has purchased the garage formerly owned by Chester Stewart, for $7000.

A. H. Meester, who has purchased the Ellsworth garage business, located in his building at Ellsworth, Minn., of Herman Nolte, has taken possession.

Willis A. Kendall has purchased the Tipton Auto garage on North Main street, Tipton, Ind., of R. S. Ogle.

The Caldwell Garage, Frankfort, Ind., has been purchased of Clarence H. Caldwell by Harry Worline and the business will be known in future as the Service Garage Company.

J. A. Sexton, Broadway and Main streets, South Amboy, N. J., is erecting an addition to his garage.

Jones & Indra is building an addition to its garage at 149 North Broadway, Green Bay, Wis.

W. M. Frasier, whose business has been located on East Franklin street, Huntington, Ind., has leased a business block on West State street and will move his garage to that location. The building was erected especially for Mr. Frazier, whose garage is one of the largest and best equipped in the state.

NEW CONCERNS AND PROPRIETORS.

O. H. Baum has purchased a half interest in the Chalmers Auto Sales Company, El Paso, Tex., and will conduct it with M. K. Burkhead. The company has purchased the automobile business of Joy P. Knox at 315 Texas street and a large garage will be erected on Santa Fe street.

Thomas R. Roberts, formerly general manager of the United Motor Philadelphia Company, Philadelphia, has resigned and formed a co-partnership with Charles M. Reeves. The company will locate at 1336 Race street and will handle Marion cars, made by the Marion Motor Car Company, Indianapolis, Ind.

William E. Munaw, Hazelton, Penn., has purchased the garage and property on West Chestnut street, formerly owned by George W. Smith.

George Johnson, Newman, Cal., has taken over the Pioneer garage, as successor to J. O. Eddlemon, and will conduct a general automobile business.

Charles E. McFarlan and Hal Norton of Topeka, Kan., have purchased the business of the Kansas Motor Car Company at 526-528 Quincy street. Mr. McFarlan is manager.

M. Nesbit, Winfield, Ia., has taken over the garage of the Winfield Auto & Supply Company, and together with his son, will conduct the business and do repair work.

G. H. Kuiper has opened a garage on Grand avenue, Grand Rapids, Mich., and in addition to a general automobile business, a first class repair shop will be operated.

The Crescent Garage Company, Ogdensburg, N. Y., has been purchased by H. G. Chandler of that city, and W. D. Evans of Hammond, N. Y. The equipment, automobiles and business of the company has been purchased by J. O. Speer, who will operate the firm, renting the property of Chandler and Evans.

The Robbins Auto Company, Malvern, Ia., has sold its garage, repair shop and automobile business to Salyers & Kayton, who are conducting the establishment.

The Chanslor & Lyon Motor Supply Company, Los Angeles, Cal., has established its business at 945 South Main street, that city.

Smithling Bros., which has conducted a garage business on Bellinger street, Herkimer, N. Y., has sold its interests to John Murphy of Little Falls, N. Y., and George Lewis of Middleville, N. Y.

The Price Hill Auto & Garage Company, recently formed at Cincinnati, O., has been changed to the Radel Auto & Garage Company, and the capital stock increased to $100,000. John J. Radel is president of the new concern.

The Auburn Garage & Auto Company, Fort Wayne, Ind., is the name of a new company recently formed to take over the Auburn garage on West Washington street. Louis Watson is manager of the concern.

W. S. Bashaw, owner of the Detroit Electric Car Company, has opened business at 108 Brady street, Davenport, Ia., and will handle the Detroit electric line, made by the Anderson Electric Car Company, Detroit.

The West Side Garage Company, Grand Rapids, Mich., has established a garage on West Bridge street. Lee Rockwell and L. D. Van Hof, members of the company, will also conduct a first class repair department.

The Universal Auto Repair Company, Hartford, Conn., has been reorganized and will hereafter be known as the Universal Auto Company. The concern has secured large quarters in the Whitmore building.

Ruebuckert & Witt, Masillon, O., has changed its name to the Motor Sales Company. The business is to be enlarged and general repairing and overhauling departments will be installed.

John F. Miller has taken over the Tarkington garage on South Jefferson street, Marion, Ind., and the company of which he is the head will also conduct a repair department with modern machinery.

The Grand Rapids Automobile Painting Company, Grand Rapids, Mich., has been formed and has located its business at 59 LaGrave avenue.

The Eastern Motor Car Company, 827 South Olive street, Los Angeles, Cal., has been purchased by George B. Kirkwood, who also takes over the name and good will of the concern.

J. P. Beck, Saginaw, Mich., has opened a new garage on Germania street. He will conduct an automobile storage business.

George O. Jameson, formerly manager of the Interstate & Supply Company, Des Moines, Ia., has purchased the accessory interest of that concern and has established business in the Capital City Commercial College building.

The Grand Garage, Sebastopol, Cal., has been established on Main street by Dr. J. J. Keating, who has leased it to S. P. Cleek. The latter is distributor for the Studebaker cars, made by the Studebaker Corporation, Detroit.

W. B. Elliot & Co., Bartow, Fla., has purchased the Winter Haven garage of that place and will operate the business.

Wesley Cook, Mitchell, S. D., who recently conducted a garage at 119 South Main street, has purchased an interest in the Dakota Auto Machine Shop at 219 West First street and has located at that address.

Harry Burton has sold his interest in the Burton & Crabb garage, Chino, Cal., to A. Johnson and the business is being operated under the name of Crabb & Johnson. The company is agent for the K-R-I-T cars, made by the K-R-I-T Motor Car Company, Detroit, Mich.

Owens & Laws, formerly of Denver, Col., has opened a new garage at 285 North Thomas street, Pomona, Cal. The latest improved machinery has been installed and a specialty will be made of repair work.

G. R. Dillion and Max Wolcott, Corning, N. Y., have formed a partnership and are conducting a general automobile agency, supply and repair business on Tioga avenue.

The Sheely Motor Company, Passaic, N. J., has opened a garage on Sherman street. Modern machinery for repair work has been installed.

TRADE PERSONALS.

Frank La Flem, well known in automobile circles in Philadelphia, has been appointed Philadelphia representative of the Henderson Eastern Motors Company.

C. A. Forster has been appointed commercial manager of the Maxwell Motor Company. Mr. Forster was formerly connected with the Burroughs Adding Machine Company with which concern he gained wide experience in the handling of big sales forces.

Max Wilring, formerly production manager of the Flanders Motor Company, has taken a similar position at the Detroit factories of the Studebaker Corporation, maker of Studebaker pleasure and commercial vehicles.

V. K. McBride, sales manager for the Universal Truck Company for several years, has become sales manager for the Maxwell Motor Company with headquarters at Detroit. He will have charge of the truck division.

William L. Colt, president of the Colt-Stratton Company, New York City, eastern distributor for the Cole cars, recently sailed for Panama for a three weeks' vacation.

Sanford E. Marks, for nine years the New York State representative of the Diamond Rubber Company, has taken charge of the district sales department of the Sanford Motor Truck Company, Syracuse, N. Y., and will at once establish agencies.

E. Ralph Estep, formerly manager of the advertising department of the Packard Motor Car Company, Detroit, has been appointed director of the art department of the American Bank Note Company, New York City.

Alfred G. Ayert has taken charge of the new commercial department of the Ford Motor Company, recently added to the Seattle branch of the company.

Isaac Kinsey, president of the Kinsey Manufacturing Company, a subsidiary company to the Willys-Overland Company, Toledo, O., was recently elected president of the Toledo Manufacturing and Supply Company, 2 St. Clair street, Toledo.

L. M. Railsback, formerly sales manager of the Jackson-Church-Wilcox Company, Saginaw, Mich., has resigned to become associated with Merrill M. Wilcox, who has organized a new company for the manufacture of automobile accessories.

Harry L. Bill, who has been connected with the manufacture of Winchester rifles, bicycles, and Ford, Reo, Corbin, Metzger and Chalmers cars, has joined the engineering staff of the Ignition Starter Company, Detroit.

C. F. Harding, who for the past 11 years has been connected with the sales department of the B. F. Goodrich Company, has resigned to join the sales force of the Kelly-Springfield Tire Company.

Frederick Edward Wilson has resigned as sales manager of the Henderson Motor Car Company, Indianapolis, Ind., maker of Henderson cars, to take a similar position with the Tone Car Corporation, Indianapolis, maker of the new Tone line.

Thomas Hay, formerly manager of the Ford branch at Chicago, has taken the distributing agency for Staver cars in northern Illinois, eastern Iowa, Indiana and southern Michigan.

George A. Mevis, formerly manager of the truck department of the Knox Automobile Company, Springfield, Mass., is now connected with the truck sales department of the Packard Motor Car Company of New York, with headquarters at Hartford, Conn.

E. L. Jacoby, southern sales manager, and Thomas Toner, also connected with the sales department of the Flanders Motor Company, have resigned.

R. S. Hartzell, formerly of the Detroit branch of the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, has been appointed manager of the Cleveland branch. He succeeds Mr. Hammerle, who has been promoted to the district office at Detroit.

Ralph C. Lewis, general manager of the Beaver Manufacturing Company, Milwaukee, Wis., has resigned to assume the management of the Lewis Motor & Engineering Company, recently formed to manufacture a line of block motors.

George C. Kloss of New York City is the new manager of the Binghamton Motor Car Company, Binghamton, N. Y. The garage is to be remodelled and a modern machine shop installed.

A. J. Inderrieden, who has long been one of the foremost salesmen of the automobile accessory trade, covering the eastern states for the Warner Instrument Company, Beloit, Wis., maker of the Warner auto-meter, is to be eastern district sales manager for the big Stewart-Warner Speedometer Corporation, a combination of the Warner Instrument Company and the Stewart & Clark Company. Mr. Interrieden will retain his present quarters on Broadway, New York City.

A. R. Erskine, treasurer of the Studebaker Corporation, maker of Studebaker pleasure and commercial vehicles, has returned from a trip to Porto Rico, Panama and other points.

F. C. Hoyt is manager of the new branch office and salesrooms opened at 1008 Boylston street, Boston, by the Havers Motor Car Company, Port Huron, Mich., maker of Havers cars.

A. F. Osterloh, who has been western sales manager of the Goodyear Tire & Rubber Company, Akron, O., has been appointed secretary of the company. He has been connected with the Goodyear company almost since its formation and has built up a most efficient selling organization in the West.

John A. Mills has purchased the Sturges garage on Isaacs street, South Norwalk, Conn., of F. D. Lawton. Mr. Mills will conduct a first class establishment under the name of the John A. Mills garage.

F. E. Moskovics, former sales manager of the Remy Electric Company, Anderson, Ind., maker of Remy magnetos, has resigned, to take effect March 1, and will return to the Wyckoff, Church & Partridge Company, maker of the Vaughan cars.

C. Roy Clough, formerly with the King Motor Car Company, Detroit, maker of King cars, has joined the forces of the Chalmers Motor Company, Detroit, as district sales manager for Ohio, Kentucky, Indiana and Michigan.

J. W. Bully, president of the Mercury Manufacturing Company, Chicago, maker of Mercury trucks, has returned to Chicago after a short trip through eastern territory.

William F. Cowham, president of the Cutting Motor Car Company, Jackson, Mich., maker of Cutting cars, died at his home Monday, Jan. 13.

NEW BUILDINGS AND REMOVALS.

William H. Vogel, Wilmington, Del., is building 10 garages on his property at the corner of Concord avenue and Tatnall street, that city, which he will lease. The tenants will have the privilege of storing all equipment, repair apparatus, etc. Mr. Vogel will also erect a large repair shop in the vicinity for the accommodation of his tenants.

Sherlock & Son, Burbank, Cal., will occupy a new one-story garage being built at Second street and Angeleno avenue. It will be equipped with modern machinery for repair work and will contain a well lighted salesroom.

F. E. Linnell & Son, Roseville, Cal., is having a two-story reinforced concrete garage built on the Wright property.

The Ajax Auto Sales Company, Springfield, Ill., has opened a garage at 315 South Fourth street under the management of J. L. Pickering.

J. B. Romans & Co. has moved into the company's new garage on Main street, Denison, Ia.

E. E. Morris of Wichita, Kan., will erect a brick garage and repair shop at the corner of English street and Lawrence avenue. It will be one story high and later two more stories will be added.

The Knickerbocker Motor Car Company, Binghamton, N. Y., will occupy a new garage at Wall and Henry streets, work on which is well under way. A modern repair shop will be installed and the cost of the new plant will be $40,000.

The Square Deal Auto Company, Baltimore, Md., has opened a new salesroom and service station at 415 West Fayette street. The first floor is given over entirely to salesroom and offices, while the second and third floors will be used for cars, trucks and used vehicles.

Robert J. Guy, Detroit, formerly in charge of the repair department of the Studebaker Corporation, is managing a new garage at 65-69 Congress street, West, in which he is prepared to undertake all kinds of work.

The Fourth Street Garage, at 37-39 Fourth street, Chelsea, Mass., has been completed and is now occupied by Harden & Waugh. The garage is fireproof and contains modern appliances for the trade. The opening was attended by an entertainment.

Fred Hulsebus, manager of the Shelby County Auto Company, Harland, Ia., has contracted for a large addition to be built to the garage of the concern.

Jacob Brown, manager of the Central Vulcanizing Company, Albany, N. Y., has purchased a two-story brick building at 148 Central avenue and it is being remodelled for the concern, which will utilize the entire building. A large garage will be established on Bradford street, to which street the building extends.

V. V. Haldacker, Danville, Penn., has purchased a livery stable and lot on Canal street. He will raze the building and utilize the site for a modern garage.

The Vulcan Motor Service Company, Pittsburg, Penn., has plans for a two-story reinforced garage and salesroom, to cost $100,000.

Walters & Hand, Wheeling, W. Va., has opened a garage and repair shop in the Walters building and is negotiating for several new agencies in addition to the Overland cars, which it now handles.

Kraege & Hinsey, Yorktown, Tex., is building a new garage on Fifth street, which will be fitted with modern machinery.

NEW AGENCIES.

The Providence Auto Equipment Company, 11 Dorrance street, Providence, R. I., has taken the R. I. V. ball bearings for the State of Rhode Island, and as it is carrying a large stock will be able to fill all orders promptly.

The Bosch Magneto Company, New York City, has appointed the Powell Supply Company, 2119 Farnam street, Omaha, Neb., and the Kansas City Automobile Supply Company, 1504 Grand avenue, Kansas City, Mo., distributors of the Bosch products in their respective territories.

The Dillon-Goodwin Company has opened a salesroom at 345 Van Ness avenue, San Francisco, Cal. The Moon car, made by the Moon Motor Car Company, St. Louis, Mo., will be handled.

The Motor Vehicle Sales Company, Kalamazoo, Mich., recently formed, is to open salesrooms at 135-137 Farmers avenue. The company has purchased the Buick agency of David Reid and its territory will embrace Kalamazoo and three other southwestern Michigan counties. The officers of the concern are: President, C. C. Dougherty; secretary and treasurer, H. A. Worthington; sales manager, B. O. McElroy.

Charles S. Marshall, for several years with the branch of the United States Tire Company at Minneapolis, Minn., has gone into business for himself and has established the Marshall-Racine Rubber Company at 911 First avenue, South. He will handle the Northwestern distribution of the Kelly-Racine tires.

Seymour Barr of the Scott County Mercantile Company, Davenport, Ia., has taken the agency for the Paige car, made by the Paige-Detroit Motor Car Company, Detroit, for Scott county in Iowa, and Rock Island and Mercer counties in Illinois. His headquarters are at Davenport.

A. W. Salyers, former Buick commercial car representative at Indianapolis, Ind., and William Small, former Buick dealer at Marion, Ind., have formed the Salyers-Small Company, Indianapolis, to succeed H. C. McVey in the distribution of Little and Chevrolet cars in that city, Mr. McVey having been called to the Chevrolet factory at Detroit.

W. L. Tedford, principal owner of the Tedford Auto Company, Little Rock, Ark., has sold his business with the exception of the new car sales department, which he will continue to operate. He handles the Overland cars, made by Willys-Overland Company, Toledo, O. F. L. Butler, former foreman, has purchased the repair department of the company and it will be known as the Butler Repair Company. The accessories were taken over by J. B. Pearson, treasurer of the Tedford company, and this part of the business will be styled Motor Car Supply Company. All three concerns will remain at the present quarters on Ninth street and Mr. Tedford will store his cars in the garage.

The Holsman Sales Company, recently formed at Des Moines, Ia., is occupying temporary quarters at 919 Locust street. J. A. Holsman, formerly with the United Motor Des Moines Company, is president and has the agency for the King cars.

Dwight I. Holmes and Arthur A. Lee of Los Angeles, Cal., have opened salesrooms at 1231 South Flower street, where they are handling Lancia cars and Speedwell trucks.

The Pan-American Motors Company, San Francisco, Cal., has taken over the newly formed Inter-State Motors Company and will move to the latter's place of business on Golden Gate avenue, near Jones street. The company now has the agencies for Dayton and Piggins trucks and Inter-State and Great Western cars.

TRADE INFORMATION EXCHANGE BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for Forwarding.

ACCESSORY AGENCIES.

4355—New York State Garage is interested in a complete line of equipment, supplies and accessories, for which it would take agencies.

3091—Iowa Garage, occupying new quarters, would take agency for good line of automobile supplies.

5273—Massachusetts Firm, recently incorporated to do a general automobile business, is interested in everything connected with accessories and supplies for pleasure and commercial vehicles. A good line of speedometers, tops, tire covers and irons is especially desired.

2976—Tennessee Concern is desirous of securing a first class line of accessories, supplies and equipment for pleasure and commercial vehicles.

8126—California Firm would like to represent first class makes of general accessories and supplies.

6745—Indiana Company, doing good business, will take line of first class accessories, supplies and equipment for pleasure cars and motor trucks.

4231—Maine House, recently established in new quarters, desires catalogues and books of accessories and parts with view of taking agencies for same.

3746—Missouri Concern, handling high grade cars, is seeking agencies for pleasure car supplies and commercial vehicle equipment.

6764—Kentucky Company, in prosperous condition, is seeking to extend its business and is in the market for the agencies for supplies, accessories and equipment for pleasure cars and motor trucks.

1291—Idaho Firm, doing retail and wholesale business, would take agency for good line of accessories and supplies for its territory.

7968—New York State House is seeking representative for first class makes of accessories and supplies.

CAR AGENCIES DESIRED.

7227—Idaho Concern, reorganized with increased facilities, would take the agency for a car selling from $1000 to $2000.

2041—Florida Company, enlarging its business with increased capital, desires the agency of a car listing from $750 to $3000.

1536—South Carolina Supply Company, doing general automobile business, is considering taking agency for pleasure and commercial vehicles. Would like pleasure cars listing from $500 to $2000, for which it can secure the agency in its territory.

3259—Oregon Firm, about to open an automobile supply house and vulcanizing shop, would like agency for pleasure car selling from $900 to $1200.

6431—Alabama Concern, already handling line of first class cars, would take another line selling from $1000 to $3000.

7374—Missouri House, whose business covers two states, is interested in the agency for power wagons listing from $1000 to $2000.

6704—South Dakota Company, recently established in a first class garage building, would like agency for pleasure car selling from $495 to $2100.

7604—Iowa Firm, engaged in retail and wholesale business, is seeking the agency for a pleasure car selling at $750 to $1500.

1410—North Dakota Company, recently changed hands, is looking for a car to put on the firm's market to sell at between $1000 and $1500.

1716—California Concern, under new management, is in the field for the agency of a pleasure car selling for between $750 and $2000, and commercial motor vehicles listing from $1000 to $2500.

5061—Massachusetts Garage Company, recently incorporated, is in the market for the agency of pleasure cars listing from $700 to $3000 and power wagons selling for between $700 and $3000.

3514—New York State Garage, in prosperous condition, is capable of handling pleasure cars listing from $950 to $2000, and motor wagons from $500 to $5000.

EQUIPMENT NEEDED.

2153—Ohio Garage, which recently extended its business, is seeking information relative to complete commercial vehicle equipment and general machine shop and garage supplies.

1171—Pennsylvania Company, erecting large additions to its plant, is in the market for all kinds of garage and machine shop equipment.

2152—New Jersey Concern, recently incorporated, is interested in garage equipment and supplies.

1272—Wisconsin Firm, recently reorganized, wants garage and machine shop equipment.

8230—South Dakota House, handling three makes of pleasure cars, would like to represent line of accessories, supplies and equipment.

7369—Oregon Company, in town of 8500, conducting supply store, would like to get in touch with accessory supply concerns with view to assuming agency.

3257—California Firm, handling well known make of car, is interested in securing agency for automobile accessories, equipment and supplies.

6175—Texas Corporation, with a capital of about $200,000 and representing in that state five makes of pleasure cars and two types of motor trucks, is interested in all kinds of supplies, accessories and equipment for pleasure and commercial vehicles, for which agencies will be taken.

2972—California Dealer, now handling trucks exclusively, would take agency for first class power wagon equipment.

4962—New York State Company, about to build new garage, wants information concerning repair shop and garage equipment and supplies, including machine tools.

4756—Indiana Garage, under new management, wants machine tools, repair shop and garage equipment and supplies.

3142—California Concern, occupying enlarged quarters, is seeking a line of repair shop equipment and supplies.

6872—South Dakota Company, doing good business in new building, is interested in garage and repair shop equipment.

1291—California House, in new location, desires information relative to repair shop equipment.

1637—Texas Sales Company, which maintains large service station, is in the field for all kinds of repair shop and garage supplies and equipment, including machine tools.

2347—Florida Garage, enjoying greatly increased business, wants information concerning garage supplies, repair shop equipment and machine tools.

5520—Massachusetts House, recently incorporated, is seeking information regarding garage equipment and supplies and repair shop supplies.

6182—Georgia Firm, about to remodel building, is in the field for first class garage equipment.

7869—New York State Concern, extending its business, is desirous of acquiring a line of garage and repair shop supplies.

8643—Michigan Firm, which recently purchased an established repair shop business, is seeking supplies of various kinds.

7269—Tennessee Company, recently organized to occupy a large building, is in the market for garage and repair shop equipment and supplies.

4765—Kentucky Concern, establishing new garage, is interested in garage supplies and equipment.

2921—Michigan Manufacturing Company, about to build a large plant, is in the market for machine tools, repair shop supplies and equipment.

3917—Iowa Garage, recently moved into new quarters, is interested in garage equipment and supplies and repair shop supplies of all kinds.

7568—Iowa Company, formed a short time ago and

TRADE INFORMATION EXCHANGE--Continued.

soon to fit up new garage and repair shop, is interested in the newest and most up-to-date equipment, including machine tools, etc.

6497—Kentucky Concern, recently formed, is interested in garage and repair shop supplies, and machine tools.

4527—Florida Company, about to erect a modern garage, is in the market for garage and repair shop equipment and supplies.

7373—Missouri Company, opening a factory branch, is interested in garage equipment.

7122—Idaho Concern, recently reorganized to do general automobile business and planning to erect large, modern garage in the spring, is in the market for garage and repair shop supplies and equipment, including full line of machine tools.

3456—New York State Concern, in well established garage, is interested in repair shop equipment.

2432—Maine House, occupying fine new building, is interested in a line of garage equipment and supplies and repair shop supplies.

5443—New York State Concern, remodelling building for its purposes, desires information relative to full line of machine tools, garage and repair shop supplies and equipment.

1542—North Dakota Firm, recently changed hands, is interested in a complete line of repair shop and garage supplies and equipment, machine tools, etc.

TO DOUBLE ITS CAPACITY.

Universal Motor Truck Company Secures Additional Capital and Will Increase Plant.

Fred K. Parke, secretary, treasurer and general manager of the Universal Motor Truck Company, Detroit, maker of Universal trucks, has announced that the company has been incorporated under the laws of Delaware, the capital stock being $1,200,000, of which $500,000 is preferred stock and $700,000 is common. All stock has been sold and work will be begun at once on the erection of a factory quite as large as the present plant.

The new building will adjoin the old one, the company having owned the entire square block of property since its organization. It will cost $250,000 without the machinery. According to Mr. Parke the Universal company will soon be one of the largest concerns in the world producing commercial vehicles and as the business increases other additions will be made.

UNDERWRITERS' ORGANIZATION.

Western Insurance Men Meet at Chicago, Formulate Plans and Elect Officers.

The Western Automobile Underwriters' Association was organized at a meeting of companies writing that class of insurance, held at Chicago recently. P. D. McGregor of the Queen Company presided and F. J. Sauter of the A. D. Baker Agency, was elected secretary. William S. Warren, who has been active in the organization work, reported on the previous meetings and the negotiations which have been carried on with the eastern interests, together with the plan for co-operation between the New York and Chicago conferences, providing for an interlocking board of directors.

The constitution, bylaws and rules of practise were submitted and adopted. The following officers were elected: President, P. D. McGregor, Queen; vice president, Thomas E. Gallagher, Aetna; secretary and treasurer, F. J. Sauter, A. D. Baker General Agency; executive committee, T. E. Gallagher, William S. Warren, Liverpool & London & Globe; H. C. Eddy, Commercial Union; C. E. Dox, London & Lancashire & Orient; A. D. Baker, Michigan Commercial & Old Colony; F. H. Osborn, Federal Union; F. R. Bigelow, St. Paul F. & M.; Marshall & McElhone, Fireman's Fund, and S. K. Crawford, American Automobile Company.

AMENDMENTS IN OHIO.

Automobile Clubs Calling Attention of Owners to Necessary Legislation.

The organized motorists of Ohio are urging all automobile owners to aid in the passage of five amendments to the present law, which are claimed to be decidedly necessary. The legal committee is actively engaged in pressing the matter before the legislature. The five amendments provide as follows:

Compelling all vehicles, whether horse drawn or motor propelled, to be equipped with lights both front and rear; emergency placard for use in the event that one of the regularly issued number plates is lost or mislaid; establishing local depots where license tags may be obtained without waiting for return from Columbus; making it clear that no city or town may enact ordinances taxing automobiles in addition to the fee demanded by the state; making it a felony, punishable with penitentiary imprisonment, for any person to steal an automobile.

INCREASES CAPITAL STOCK.

Maker of Midland Cars Prepares for Enlarged Production Facilities in Present Quarters.

The capital stock of the Midland Motor Company, Moline, Ill., maker of Midland cars, has been increased from $100,000 to $300,000. Decision to vote the increase was reached at a special meeting of the stockholders and the entire additional issue of stock has been subscribed.

The purpose of the increase is to enlarge the output of the plant. No additional buildings will be erected at present, the size of the plant being such that it can accommodate a comfortable growth in the Midland production. It was made known at the stockholders' meeting that during the present year 1006 cars will be built and placed on the market.

PUBLISHER'S ANNOUNCEMENT!

MARCH 8th

BOSTON SHOW NUMBER AUTOMOBILE JOURNAL

What AUTOMOBILE, New York, has to say about the Boston Show

"Be ready for this big opportunity."

"Cash in on the Boston Show—the last big show of the year—the selling show."

"Tell your story when interest is at buying heat, tell it big and bold."

The above does not do justice to the Boston Automobile Show.

This will be the largest display of the year, as it has been in the past. Manufacturers and their representatives have always considered it a money maker, not just a display.

Advertisers using the March 8th issue of The Automobile Journal will reach New England buyers. Patronage will not be secured from New York and Chicago.

The Automobile Journal enjoys an exclusive position in this field, is supported by Eastern motorists and it is the only logical medium to use to secure the kind of publicity that will be productive of results. Send your copy today.

Automobile Journal Publishing Co.,
Times Building - - - Pawtucket, R. I.

MOTOR TRUCK

The exhibition of industrial vehicles to be made at Boston the week of March 19-25, inclusive, will be the most complete ever held in America.

It will be distinctly a showing of motor wagons and trucks.

Boston is the commercial centre of New England. It is accessible from every part of these states by comparatively short rides.

The visitors to the Boston Service Wagon Show will be business men, keenly interested and ready to buy.

The show will be productive of enduring returns for all exhibitors. It is the logical opportunity to display a new make of machine, and it is equally desirable to exploit those that have established reputation.

The MOTOR TRUCK is the recognized national authority on highway transportation and haulage economy. It is the best known publication to the business men of New England who are studying and investigating the problems of vehicle use.

Your announcement made in the Boston Service Wagon Show Number, to issue March 15, will reach and be read by men interested in motor wagons identified with the widely diversified lines of New England commercial and industrial enterprises. This will be the largest power wagon show of the year, and New England is the richest and best market for machines in the world.

This Show Number Will Issue March 15

Copy for this issue must be given prompt attention. A wire will secure reservation of space.

THE MOTOR TRUCK
Times Building - Pawtucket, R. I.

Do You Want To Know More About Pleasure Cars and Trucks?

The most instructive and valuable series of automobile mechanical books ever published are named below. These works have within the past year been rewritten and revised and today form the most complete library of automobile mechanical information that can be found. The expositions are as valuable to the engineer as the layman. The series form an encyclopedia of subjects of interest to the student, mechanic, repairer, builder, owner and driver. **One thousand pages of text, more than 1500 specially prepared photographs, drawings, diagrams, charts and designs.**

All discussions are distinct and are given over wholly to the subjects which their titles imply.

Motor Car Operation	**50c**	**The Motor Car Chassis, Maintenance and Repair**	**25c**
Overhauling, Rebuilding and Repairing the Motor Car	**50c**	**Lighting the Motor Car by Electricity**	**50c**
Internal Combustion Engine, Maintenance and Repair	**35c**	**Maintenance and Repair of Motor Car Tires**	**25c**
Carburetor Construction, Maintenance and Repair	**35c**	**The Motorcycle, Construction, Operation, Care and Repair**	**35c**
Magneto Systems	**35c**	**Battery Ignition System**	**35c**

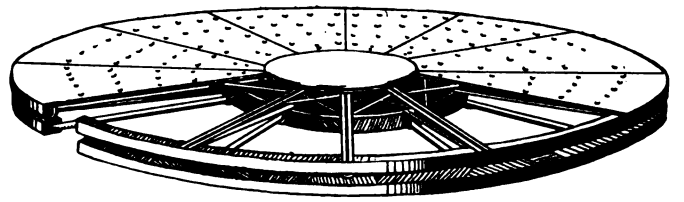
Price for the full set of 10 books........................$3.75

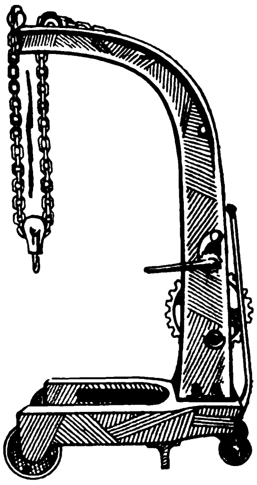
Aerial Navigation, 160 pages, deals with this subject exhaustively, containing full page working diagrams and plans of all successful flying machines, $1.00.

WHEN THE FULL SET OF 10 MECHANICAL HANDBOOKS IS PURCHASED, ONE YEAR'S SUBSCRIPTION TO EITHER THE AUTOMOBILE JOURNAL, THE MOTOR TRUCK OR THE ACCESSORY AND GARAGE JOURNAL, IS GIVEN FREE OF CHARGE.

REMITTANCE MUST ACCOMPANY ORDER. WRITE NAME AND ADDRESS PLAINLY AND SPECIFY CLEARLY THE BOOKS YOU WISH TO PURCHASE. MAKE REMITTANCE TO

THE AUTOMOBILE JOURNAL PUBLISHING CO. - Times Building, Pawtucket, R. I.





For the Public and Private Garage
UP-TO-DATE

The most important question is that of handling your cars in the shortest time at least expense possible and with all chance of accidents done away with.

With the "UNIVERSAL" Automobile Turntable in your garage, you can drive both in and out "front end first"—no more backing out. Just run in on the Table, one little push making a half revolution, and your car is ready to start out.

These Tables are made in four sizes—one for every use—with capacity for supporting from the lightest runabout to the heaviest truck.

Better write today for full particulars, getting our Catalog "C-8."

The Indispensable "Handiest Tool in the Shop"

Does your lifting and tugging at one-fifth the expense you are now paying for this. No matter if you do have stationary chain hoists, you will find this "Handiest Tool" indispensable in your garage.

Write for our catalog "EE-7," and full information how to lessen cost.

The Canton Foundry & Machine Co.
CANTON, OHIO

TEXACO
MOTOR OIL

Subscribe to

The Automobile Journal

12 Issues **$1.00 the Year**

Guard Your Tires

Make them proof against light, air, oil and moisture---make them look like new and wear like new by using Tirenew and Narco Tire Cut Filler.

TIRENEW
TRADE MARK

An unvulcanized, liquid, rubber compound---waterproofs and protects the inner fabric from decay.

Makes Tires Look Like New

Narco
TIRE CUT FILLER

A TIRE PRESERVER
NATIONAL RUBBER CO.
TIRENEW
ST. LOUIS, U.S.A.

a self-vulcanizing, non-inflammable, combination rubber cement, cut filler and mastic. Fills cuts and puncture holes---heals over night---becomes like a part of the tire. $1.00 a tube.

Dealers—Car Owners

Send $1.00 for a trial can of Tirenew---enough for 10 tires.

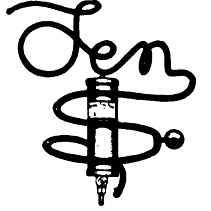
NATIONAL RUBBER COMPANY
4433 Narco Bldg., St. Louis, Mo.

NARCO
TIRE CUT FILLER
HEALS TIRE CUTS

Pumps Pure Air Only
$10

Complete---NO EXTRAS

NOT A DROP OF
OIL USED IN THE



DEWEY POWER TIRE PUMP

Laboratory tests prove the purity of air sent through the Dewey. There's no greasy vapor to rot your inner tubes.

Each pump is tested to 180 lbs. by its own high quality dial pressure gauge.

The special hose---12 ft. long---is factory tested to 1000 lbs. You'll not find its equal on pumps costing much more money.

Adapters furnished for any car.

Break the Dewey--or any part of it--within one year and we will replace it free.

Write us if your dealer hasn't the Dewey.

THE DEWEY-ANDERSON CO.
450 Woodruff Avenue Toledo, Ohio

"PASS THEM ALL"

Knox
BEST BY TEST
MOTOR CARS

Send for Pleasure or Commercial Catalogue.

KNOX AUTO CO., Springfield, Mass.

STOP CRANKING!

H. E. Co. Priming Spark Plugs

Makes Cranking of Motor Easy in the Coldest Weather

The simplest and most Scientific Priming Spark Plug yet devised.

Made of mica and guaranteed against leaking compression.

A set of one-half inch for . . . $4.00

List Price $1.25

We have an interesting proposition which we are making to jobbers and dealers. *Write.*

HEINZE ELECTRIC COMPANY

LOWELL, MASS. **DETROIT, MICHIGAN**

TRADE **VELLUMOID** MARK

Patented November 14 1905

GASKETS

Vellumoid resists gasoline, naphtha, kerosene and petroleum products, vegetable and animal greases and oils, cold and lukewarm water, brine, etc. Used in automobile construction for cylinder gaskets, crank-case cover gaskets, oil-pump body cover gaskets, water-pump inlet elbow gaskets, clutch cover gaskets, differential cover gaskets, and gaskets for oil, water and gasoline connections. Vellumoid is not recommended for hot steam under pressure.

Vellumoid is sold in rolls, 36 inches wide or cut into gaskets to pattern. We make it in five different thicknesses. Write us your requirements and let us quote you.

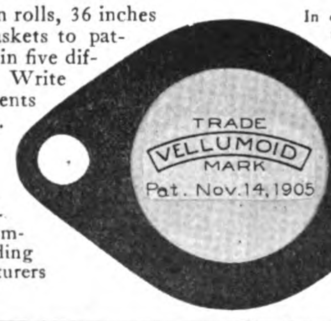
Vellumoid is stronger and more pliable wet than dry. Easy to work, satisfactory, durable. Vellumoid is used by the leading automobile manufacturers of the country.

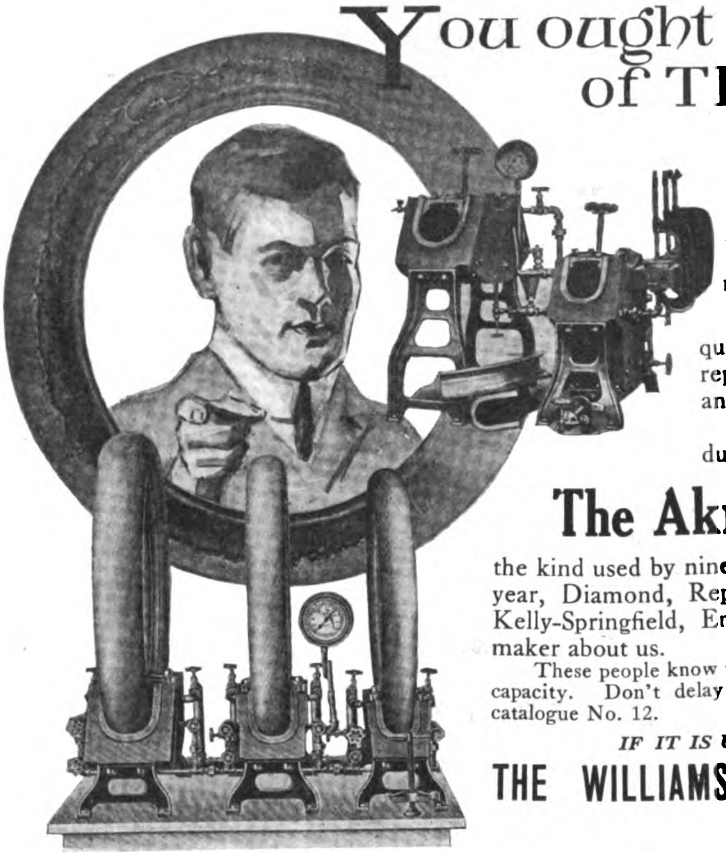
In order to introduce this stock we make this special offer on any quantity of Vellumoid amounting to 50 cents or over.

We will deliver by Parcel Post Prepaid to any point in the United States at the following prices.

Thickness	Price per sq. yd.
.033 ins.	$1.40 sq. yd.
.021 ins.	1.20 sq. yd.
.015 ins.	1.00 sq. yd.
.010 ins.	.80 sq. yd.
.006 ins.	.50 sq. yd.

Charles D. Brown Co., Inc.
Managers of Sales
49 FEDERAL STREET, BOSTON, MASS.





You ought to share in the profits of TIRE REPAIRING

Forty Million Dollars will be spent during 1913 for tire repairs. Every hundred cars will produce at least $3500.00 worth of this profitable business. Every motorist must have tires repaired. Every motorist in your vicinity is a possible customer.

There are large profits in tire repairing. Requires little capital to equip a shop with the best repairing outfit made. The equipment can be paid for and a good profit earned in a short time.

Get the right kind of equipment—one that produces work you can guarantee—

The Akron-Williams Equipment,

the kind used by nine out of ten such manufacturers as Firestone, Goodyear, Diamond, Republic, Shawmut, Walpole, Federal, Pennsylvania, Kelly-Springfield, Empire, Ajax-Grieb, Swinehart, etc. Ask your tire maker about us.

These people know what is practical. We can equip a repair plant of any desired capacity. Don't delay getting into this profitable business. Write today for catalogue No. 12.

IF IT IS USED TO REPAIR TIRES WE MAKE IT

THE WILLIAMS FOUNDRY & MACHINE COMPANY

ASH STREET, AKRON, OHIO

Send for Our Proposition

Satisfaction or money back guarantee, is the only basis on which they are sold.

Send for interesting charts showing saving of gasoline on basis of 20 cents a gallon.

If you sell one man He will sell all of his friends for you.

¶ A motor builder says Planhard Carburetors make new engines of old ones.

¶ The flexibility and control amazes new users. No springs, valves or cams. Absolutely automatic. Permanent adjustment.

¶ Show 10% to 25% saving in gasoline, tremendous power, increased speed.

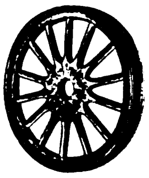
4300 miles without a miss on the "Dream".

A. N. Smith, Portland, Me., uses about one gallon less per hour on Hartford III. G. A. Schmidt, Lawrence, Mass., gets over 20 miles to a gallon on his automobile.

R. Webb Braham, Texas, "Two years without adjustment."

Planhard Mfg. Co.
1790-2 Broadway, N. Y.

Pleasure Car & Motor Truck Wheels



Eberly & Orris Wheels Are Built of Carefully Selected Bone-Dry Timber, With High Class Facilities by Expert Mechanics.

Pleasure Car or Truck Equipment Made to Any Specification and in Any Quantity.

Can Supply Any Requirement. Catalog and Price List at request.

Auto and Truck Wheels Repaired and Returned Same Day

THE EBERLY & ORRIS MFG. CO.,
Mechanicsburg, Penna.

STOLEN AUTOS

Can be prevented with our

AUTOLOCK SWITCH

Put on Coil or Dash in ten minutes. Yale key for plug. One operation. Write for descriptive folder and price.

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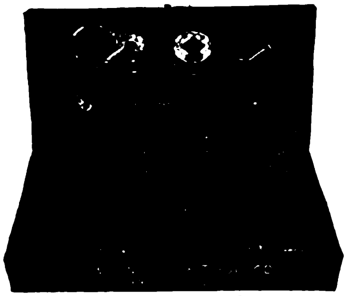

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OILS

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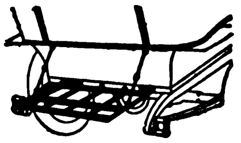

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TRUNK
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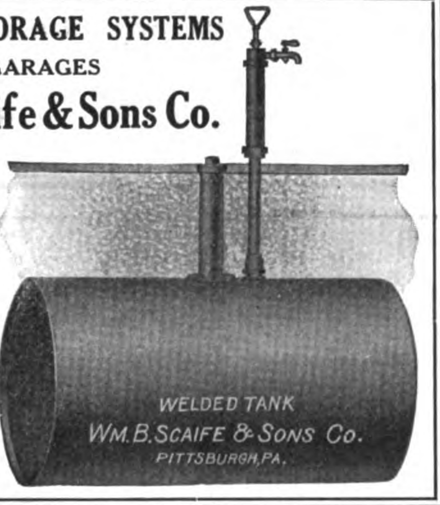
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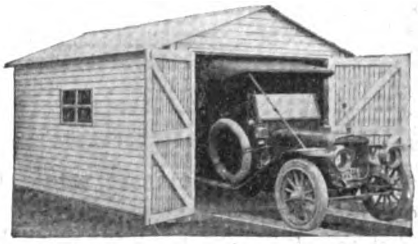

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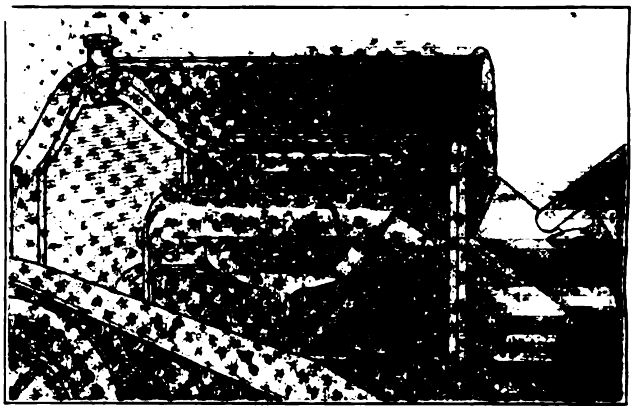

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FOR SALE—Auto bodies, fore door, new, $60.00 to $95.00. Motors; Axles; Tires; Auto parts and accessories. Closing out factory stock. Independence Motors Co., Detroit, Mich.

FOR SALE—Attention of Truck Makers—We have on hand about 500 jack shafts for a 1000 to 1200-pound truck. These we will not be able to use owing to a change in design and to an interested party that can use these parts we will make a sacrifice price. Box 50, Accessory & Garage Journal.

CHAUFFEUR'S COMPLETE OUTFIT SACRIFICED—Consisting of elegant mink fur lined coat, Persian lamb collar $35, pair of elegant bear robes $15 each, Racoon Cap $5, pair of fur gloves $4, pair of goggles 50c, one pair leather leggins $3.50. Will sell separately or the lot, all new, never worn; original price $225. G. Chase, 118 East 28th St., New York.

Leading Concerns in the Industry

Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

---

ACCESSORY MANUFACTURERS AND JOBBERS.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.
Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York.
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.
Miller, Chas. E., 97-108 Reade St., New York.
Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 818 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree Street, Atlanta, Ga.; 601-608 Baronne St., New Orleans, La.; 185 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.
Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.
Shaler Co., C. A., Waupun, Wis.
Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

AUTOMOBILE SPECIALTIES.

Sumner George, Inc., 1841 Broadway, New York.

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)
Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)
Marburg Bros., Inc., 1790 Broadway, New York. (S. R. O.)
New Departure Mfg. Co., Bristol, Conn. (New Departure.)
R. I. V. Co., 1771 Broadway, New York. (R. I. V.)

BATTERIES.

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York.
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M.)
Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)
Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (LBA.)
Branches: 186 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 248 Monadnock Bldg., San Francisco.

BATTERY EXTINGUISHERS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind.; South Chicago, Ill.
Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)
Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)
Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston; 276 Canal St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1480 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)

CARBURETION EXPERT.

Sumner, George, Inc., 1841 Broadway, New York.

CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

CARS—GASOLINE PLEASURE.

Austin Automobile Co., Grand Rapids, Mich. (Austin.)
Brush Runabout Co., 3 West 61st St., New York. (Brush Runabout, Liberty-Brush.)
Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)
Cartercar Co., Pontiac, Mich. (Cartercar.)
Cole Motor Car Co., Indianapolis, Ind. (Cole.)
Columbia Motor Car Co., 3 West 61st St., New York. (Columbia.)
Croxton Motor Car Co., Washington, Penn. (Croxton.)
Cutting Motor Car Co., Jackson, Mich. (Cutting.)
Dayton Motor Car Co., 3 West 61st St., New York. (Stoddard-Dayton.)
Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)
Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)
Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)
Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: Detroit, Buffalo, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia.
Ideal Motor Car Co., Indianapolis. (Stutz.)
Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)
Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)
Knox Automobile Co., Springfield, Mass. (Knox.)
K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)
Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.
Maxwell-Briscoe Motor Co., 3 West 61st St., New York. (Maxwell.)
Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)
Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)
National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)
Nordyke & Marmon Co., Indianapolis. (Marmon.)
Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)
Paige-Detroit Motor Car Co., Detroit. (Paige.)
Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.
Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)
Reo Motor Car Co., Lansing, Mich. (Reo.)
Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)
Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)
Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)
Studebaker Corporation, Detroit. (E-M-F and Flanders.)
United States Motor Co., 3 West 61st St., New York. (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)
Warren Motor Car Co., Detroit. (Warren-Detroit.)
White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.
Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)
Available Truck Co., 2884 Hamilton Ct., Chicago. (Available.)
Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)
Brush Runabout Co., 3 West 61st St., New York. (Brush.)
Cartercar Co., Pontiac, Mich. (Cartercar.)
Clark, E. S., 242 Freeport St., Dorchester Dist., Boston. (Clark.)
Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)
General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.
Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)
Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)
Hupp Motor Car Co., 1268 Milwaukee Ave., East, Detroit. (Hupmobile.)
Branches: See Cars—Gasoline Pleasure.
Knox Automobile Co., Springfield, Mass. (Knox.)
Mais Motor Truck Co., Indianapolis. (Mais.)
Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)
Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: See Cars—Gasoline Pleasure.
Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)
Reo Motor Car Co., Lansing, Mich. (Reo.)
Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)
Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)
United States Motor Co., 3 West 61st St., New York. (Sampson, Brush, Stoddard.)
Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)
Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)
Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.
General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: See Cars—Gasoline Commercial.
General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac, Mich. (Cartercar.)
Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

BUYERS' GUIDE---Continued

Branches: See Cars—Electric Commercial.
Knox Automobile Co., Springfield, Mass. (Knox.)
Sampson Mfg. Co., Alden, 3 West 61st St., New York. (Sampson.)
United States Motor Co., 3 West 61st St., New York. (Sampson.)
White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.
Willys-Overland Co., Toledo, O. (Overland.)

CATALOGUE SYSTEMS.

Catalogue System Co., Fisher Bldg., Chicaco, Ill.

CEMENTS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)
Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.
Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

CONTROLLERS AND ECONOMIZERS.

Moller Brothers Controller & Economizer Co., 700 Betz Bldg., Philadelphia. (M. & M.)

CRANES AND HOISTS.

Canton Foundry & Machine Co., Canton, O. (Portable Floor.)

CUSHIONS.

Leavens & Co., Wm., 32 Canal St., Boston. (Leavens Shock Absorbing.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.
Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FIRE EXTINGUISHERS.

Pyrene Co. of New England, 176 Federal St., Boston. (Pyrene.)

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASKETS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vellumoid.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)
National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

GUNS, GREASE. (See Oil Pumps.)

HOISTS. (See Cranes.)

HORNS.

Dean Electric Co., Elyria, O. (Tuto.)
Randall-Faichney Co., Boston. (Jericho, Jubilee.)
Branch: 918 Eighth Ave., New York.

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

JACKS AND LIFTING DEVICES.

Canton Foundry & Machine Co., Canton, O. (Universal Combination Auto Jack and Emergency Truck.)

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

LICENSE NUMBER BRACKETS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn.
National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Dean Electric Co., Elyria, O. (Dynalux.)
Geiszler Bros. Storage Battery Co., 514-520 W. 57th St., New York.
Remy Electric Co., Anderson, Ind. (Remy.)

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.
Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)
Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.
Haws, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.
Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.
Invader Oil Co., 80 Broad St., New York. (Invader.)
Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.
Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.
New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)
Standard Oil Co., New York. (Polarine.)
Branches: In all cities.
Texas Company, The, 7 West St., New York.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.
Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.
Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.
Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)
Marburg Bros., 1790 Broadway, New York. (Mea.)
Remy Electric Co., Anderson, Ind. (Remy.)
Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; Mass. Ave. & St. Germain St., Boston; 430-36 Van Ness Ave., San Francisco; 868 Woodward Ave., Detroit; 1226 S. Olive St., Los Angeles, Cal.; S. W. Cor. Cherry & Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; Seattle, Wash.; London, Eng.; Buenos Ayres.

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.
Emblem Manufacturing Co., Angola, N. Y. (Emblem.)
Branches: Los Angeles, San Francisco.
Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)
Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)
Swenson, B. A., 522 Broad St., Cor. Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Rutenber Motor Co., Marion, Ind. (Rutenber.)

PACKING, FIRE

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

PATCHES.

Invincible Puncture Proof Tire Co., 53 Sabin St., Providence. (Invincible.)
National Motor Supply Co., 1911 Euclid Ave., Cleveland.

POLISH.

International Metal Polish Co., Quill St. and Belt R. R., Indianapolis, Ind. (Blue Ribbon.)
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

PUBLICATIONS, AUTOMOBILE.

The Automobile Journal, 24 issues, $1.00 the year.
The Motor Truck (Commercial Car) Monthly, $1.00 the year.
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Maintenance and Repair of Motor Car Tires .... .25
Lighting the Motor Car by Electricity.. .25
Send Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I.

PUMPS, OIL AND GREASE.

Randall-Faichney Co., Boston. (B-Line.)
Branches: See Horns.

PUMPS, TIRE.

Brown Co., Syracuse, N. Y. (Brown Impulse.)
Dewey-Anderson Co., Toledo, O. (Dewey Power.)
Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RADIATOR CONNECTORS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)
Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.
United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 30-32 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (LBA.)
Branches: See Batteries.

SHIELDS, MOTOR.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Eliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1841 Broadway, New York. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Heinze Electric Co., Lowell, Mass. (H. E. Co. Priming.)

Janney, Steinmetz & Co., Philadelphia.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)

Randall-Faichney Co., Boston. (Mac-Kae.)
Branches: See Horns.

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: See Magnetos and Magneto Supplies.

Standard Co., The, Torrington, Conn. (Black Eagle.)

SPARK PLUG TERMINALS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

Randall-Faichney Co., Boston. (Mac-Kae Blitz.)
Branches: See Horns.

SPEEDOMETERS.

Hoffecker Co., The, Motor Mart, Boston. (Hoffecker.)

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 829 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Marburg Bros., Inc., 1790 Broadway, New York. (Marburg-Hagen.)

Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

SPROCKETS.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)

STEEL PARTS, SEAMLESS.

Standard Welding Co., Cleveland.

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

TAPE, ASBESTOS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE ACCESSORIES.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Shaler Co., C. A., Waupun, Wis.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

National Rubber Co., 4433 Papin St., St. Louis, Mo. (Tirenew.)

Page-Lester Co. 2644 Indiana Ave., Chicago. (Tite-Wad Rubber Putty.)

TIRE REMOVERS.

O-Tak-A Tire Remover, Le Roy, N. Y.

TIRES—CASINGS AND INNER TUBES.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-813 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Gaulois Tire Co., 1926 Broadway, New York. (Gaulois.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

TIRES—CUSHION.

Cataract Rubber Co., Wooster, O. (Cataract.)
Branches: Boston, New York, Providence.

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special Motz Cushion.)
Branches: Boston, New York, Philadelphia, Pittsburg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright. G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Polack Tyre and Rubber Co., 246 W. 59th St., New York City. (Polack.)

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS—See Cars, Commercial.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

TURNTABLES.

Beach Co., T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

Canton Foundry & Machine Co., Canton, O. (Universal.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 520 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VALVE GRINDERS.

Wall, J. H., 290 Hope St., Bristol, R. I. (Ford.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Shaler Co., C. A., Waupun, Wis. (Shaler.)

Williams Foundry & Machine Co., Akron, O.

WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WELDING, STEEL.

Standard Welding Co., Cleveland.

WHEELS.

Eberly & Orris Mfg. Co., Mechanicsburg, Penn.

WIRES AND CABLES.

Diamond Rubber Co., of N. Y., Akron, O. (Diamond.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

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BLUE RIBBON LINE OF POLISHES

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Blue Ribbon Nickel Polish

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Keeps the original finish and Gloss on the Body of the machine—No Grease to Catch Dust—Leaves No Coating.

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Saves Expensive Repair Bills, Time and Trouble

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GARAGE JOURNAL
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AUTOMOBILE CHAMBER OF COMMERCE.

National Association of Automobile Manufacturers and Automobile Board of Trade Amalgamate in New Organization--Purposes Similar to Old Bodies with Possible Increase of Scope.

THE proposed amalgamation of the National Association of Automobile Manufacturers and the Automobile Board of Trade became an accomplished fact at a meeting of the joint committee representing the two organizations in New York City, March 19, when the charter of the Automobile Chamber of Commerce, Inc., which had previously been approved by the New York courts, was formally adopted. The new association contemplates a membership embracing the entire industry, and virtually marks a return to the situation which prevailed before the organization of the old Association of Licensed Automobile Manufacturers, following the commencement of the so-called Selden patent litigation some 10 years ago.

The officers of the Automobile Chamber of Commerce are: President, Col. Charles Clifton; vice president, W. C. Leland; treasurer, Col. George Pope; secretary, R. D. Chapin. The following compose the board of directors: Charles Clifton, Charles C. Hanch, Hugh Chalmers, Sydney Waldon, Samuel T. Davis, W. C. Leland, Windsor T. White, William E. Metzger, H. O. Smith, Albert L. Pope, L. H. Kittredge, R. D. Chapin, G. W. Bennett and H. H. Rice. These men will hold office until June 4, 1914, after which the annual meetings will be held the first Thursday after the first Wednesday in June. In the distribution of officers, the Board of Trade received the presidency and treasurership, while the N. A. A. M. was given the vice presidency and secretaryship.

Col. Charles Clifton, President, Automobile Chamber of Commerce.

The object of the new organization is somewhat similar to that of the old bodies, although new lines of activity may be taken up later. The interests of the automobile industry will be advanced and harmony will be promoted, while the chamber is empowered "to acquire by grant, gift, purchase, devise or bequest, to hold and to dispose of such property as the purposes of the corporation shall require, subject to such limitations as may be prescribed by law, including inventions, letters patent and processes, or rights thereunder, for the benefit of its members and not for pecuniary profit."

As a result of the amalgamation, the two older organizations will cease to exist as soon as their affairs can be arranged to comply with the aims and purposes of the new Chamber of Commerce, which is to become their successor in every sense of the word. It is anticipated that this will take some months, but in the meantime the new association will take up the work laid down by the older bodies, and seek to interest all manufacturers in the industry. The corporate life of the Chamber of Commerce is fixed at 25 years according to the provisions of the charter secured by it.

In addition to the main object of the organization as stated above, the charter also provides for developing the trade in which the members are engaged in this country and abroad, promoting the construction of better highways, advocating the enactment of just and equitable laws affecting the industry, etc.

GARFORD HEADS NEW CONCERN.

Expected That Plant Will Be Located in Toledo for Manufacturing Aluminum Products.

A. L. Garford of Elyria, O., formerly head of the Garford Company of the same city, maker of Garford pleasure cars and trucks, is at the head of a new company recently incorporated with a capitalization of $100,000. With Mr. Garford in the venture are Walter F. Brown, chairman of the Ohio Progressive state committee, and Attorneys Sigmund Sanger and E. C. Froelich of Toledo.

The new concern is known as the Garford Engineering Company and it will probably locate its plant in Toledo. Its purpose is to develop a new process of producing aluminum with the strength of steel in all forms. Mr. Garford sold his control of the Garford Company to the Willys-Overland Company about two years ago, but is understood to have retained a small financial interest in the Elyria plant.

ANOTHER CAR FROM DETROIT.

L. G. Hupp Interested in the Formation of the Tribune Motor Car Company.

The Tribune Motor Car Company, Detroit, is a new concern which has filed incorporation papers to manufacture a five-passenger, 30 horsepower touring car to sell at a moderate price. Deliveries will begin about May 1 and a deal has already been concluded for a modern factory building to be ready for occupancy in the fall.

At the head of the new concern is Louis G. Hupp and associated with him are several well known Detroit business men. From a modest beginning Mr. Hupp built up a most successful business with the Hupp-Turner Machine Company, the Hupp-James-Geyman Foundry Company and the Hupp-Johnson Forge Company, all of Detroit, he being general manager. The three plants were later merged with the R-C-H Corporation, Detroit, maker of R-C-H cars, of which Mr. Hupp was secretary and treasurer, his brother, R. C. Hupp, being president and general manager.

TO MAKE ENGINE PARTS.

C. A. Goodspeed Organizes New Concern Which Will Locate in Detroit.

A new factory for the making of automobile engine parts, to cost $20,000 on a $4000 site, is to be built and operated by a new company, the Goodspeed-Detroit Manufacturing Company, Ltd., of Detroit. The concern has a paid in capital of $30,000, and the active head of the firm is C. A. Goodspeed, who is secretary, treasurer and general manager.

He was formerly connected with the Packard and Studebaker companies of Detroit, makers of high grade pleasure cars and trucks of the same names. The site of the new factory is on Harper avenue, opposite the plant of the Regal Motor Car Company, maker of Regal cars. The building will be two stories high and will afford a large floor area.

MAY LOCATE IN THE SOUTH.

Understood That the Maker of the Only Car Has Plans for Removal.

According to information from Charleston, S. C., the Only Motor Company, Port Jefferson, N. Y., maker of Only pleasure cars, will soon transfer its plant to Mt. Pleasant, S. C., where a factory having 25,000 square feet of space will be provided. It is stated that a charter has already been applied for and that negotiations have reached an advanced stage. It is understood that southern capital is interested largely in the Only Motor Company and that the present efforts are being made by the Isle of Palms Traction Company of Charleston.

Meetings of the stockholders have been held and favorable action taken, it is said. M. Rutledge Rivers has been engaged as counsel for the company and has applied for a charter under South Carolina laws, under the name of The Only Automobile Motor Company. It is understood that the principal request of the Only company will be that the town of Mt. Pleasant provide a free site for the factory and this matter is expected to be arranged easily.

ADDS ANOTHER BUILDING.

Increasing Demand for Hudson Product Creates Need for Larger Production Facilities.

The Hudson Motor Car Company, Detroit, Mich., has added another building, the third within a year, to its 26-acre plant. The combined floor area of the Hudson factory has been made 363,000 square feet by the addition of the new structure, 578 feet in length by 90 feet in width.

The building supplants the section of the factory grounds which for some time has been used to accommodate large tents in which work was done because of a lack of room. The output of the Hudson shops has increased steadily and this move was made necessary to care for the additional business.

SPONSEL ROTARY VALVE MOTOR.

Company Being Organized to Produce New Design Probably in Detroit.

C. W. Sponsel, formerly superintendent of the General Electric Company's plant in Pittsfield, Mass., is forming a company to be capitalized at $250,000, to manufacture the Sponsel rotary valve motor. Mr. Sponsel is working at present at Racine, Wis., but it is understood that Detroit capitalists are endeavoring to have the company locate in that city.

Mr. Sponsel has worked upon his motor for many years and his first patents were secured in 1903. It is stated that a balanced valve, eliminating about 150 parts found in a poppet valve motor, forms the principle of the new motor. A model is now being made in Detroit.

BRANCH FACTORY IN SAGINAW.

J. P. Beck Will Produce Automobile Tops and Jiffy Side Curtains.

J. P. Beck of Saginaw, Mich., has secured a branch factory of the Rudd Auto Top Company, Detroit, for the former city, and it will locate in Mr. Beck's new building at Germania and Second streets. The plant is now in operation in charge of E. E. Miner.

In addition to the making of automobile tops of every description, the new factory will also manufacture the new Jiffy side curtain for which Mr. Beck has secured certain rights. The output of the new factory will be considerable.

PNEUMATIC TIRES UNNECESSARY.

Kansas City Plant to Produce Cars Equipped with Patented Steel Wheels.

J. North Carnahan of Washington, D. C., representative of the Bernston Steel Wheel Company, Bethlehem, Penn., is quoted as saying that the company will establish a new automobile factory at Kansas City, Mo., which will feature a recently patented steel wheel in an assembled car. The factory is to be one of a chain of six throughout the United States.

According to information from Kansas City, the company only manufactures the steel wheels, the motor cars proper being purchased by contract and assembled at the Bernston shops. The Bernston wheel is made with steel spokes in such manner that it is claimed pneumatic tires are unnecessary.

STREATOR PLANT REOPENED.

Limited Number of Cars Being Made and Halladay Owners Assured of Service.

It is reported that the Streator Motor Company plant, Streator, Ill., in which Halladay cars were made previous to the suspension of operations brought about by bankruptcy proceedings, is again in operation, having been taken over by A. C. Barley, secretary and director of the Rutenber Motor Company of Marion and Logansport, Ind.

Mr. Barley is said to have purchased it of the Merchants Realization Company, Chicago, which concern secured the plant at bankruptcy sale with the intention of dismantling it.

It is understood that cars are being made in a conservative way and that an adequate service department for Halladay owners also has been established. The machines will be manufactured with the idea of meeting the requirements of old agents of Halladay cars and later operations will be conducted on a larger scale.

WITH HOLLY CARBURETOR.

Charles W. Cross Becomes Sales Manager—Concern Is Adding New Buildings.

President George M. Holly of the Holly Bros. Company, Detroit, maker of Holly carburetors, makes public the appointment of Charles W. Cross as sales manager. Mr. Cross has been connected with the industry directly and indirectly for the past 14 years and has a wide circle of friends and acquaintances who will be glad to learn of his latest change.

Soon after graduating from the engineering department of Cornell university he became mechanical engineer for the Diamond Rubber Company, Akron, O., and later joined the executive staff of the Crocker-Wheeler Company as manager of its Detroit office. During recent years Mr. Cross has been associated with the subsidiaries of the General Motors Company and last year he occupied a prominent position in the selling department of the General Motors Truck Company, Pontiac, Mich.

Charles W. Cross, Sales Manager, Holly Bros. Company.

President Holly also announces that additions to the plant are now underway which will enable the company to double its output for the next 12 months. It is understood that the concern has enjoyed a greatly increased business during the past few months, making larger manufacturing facilities decidedly necessary.

FISHER QUICK ACTING VISE.

Fisher & Norris, Trenton, N. J., is manufacturing what is known as the Fisher quick acting lever vise. It is constructed of gun metal with a solid bar and all parts are interchangeable. The work is inserted in the jaws and held securely by a forward movement of the lever. The part cannot be removed until the lever is pushed back. The jaws are faced with steel, file-cut and properly tempered.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS.

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

Lathan Auto Supply Company, San Francisco, Cal.; $25,000; incorporators, J. E. Lathan, A. Lathan, A. S. Lathan.

Vulcan Manufacturing Company, Paineville, O.; $300,000; to manufacture automobiles, wagons, etc.; incorporators, F. H. Murray, E. H. Heartwell, J. C. Ward, William Truhy, Harry E. Hammar.

Anna Motor Car Company, Anna, Ill.; $2500; general garage business; incorporators, Ernest Lawson, J. J. Corzine.

Tourraine Motors Company, Newark, N. J.; $37,500; general automobile business; incorporators, C. H. Van Vleck, F. N. Kolb, E. M. Dalley.

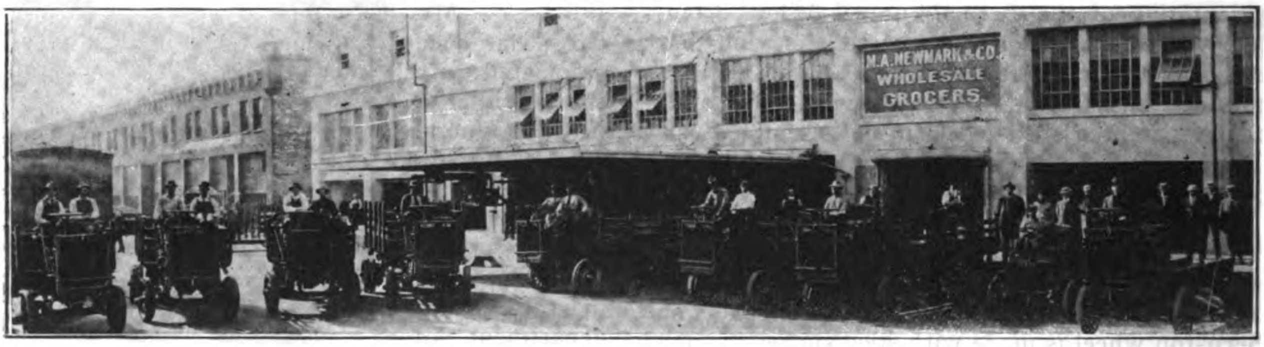
Pilot Car Sales Company, Richmond, Ind.; $50,000; to deal in automobiles; incorporators, T. F. Williams, H. E. Bradford, J. E. Hayes, C. E. Hayes, Arnold Schaer, W. D. Williams, E. F. Goggins.

Montroy Ignition Starter Company, Clarksdale, Miss.; $10,000; incorporators, E. M. Fant, E. Fant, C. L. Montroy, J. M. Montroy.

Collier Rotary Valve Company, Inc., New York City; $100,000; motors and engines; incorporators, John N. Blair, Arthur B. King, Harry D. Johnson.

Chaplin-Dille Motor Car Company, Morgantown, W. Va.; $25,000; incorporators, M. C. Wildman, O. Howard Dille, B. M. Chaplin, Minnie Chaplin, James E. Dille.

Western Auto Supply Company, Tulsa, Okla.; $5000; incorporators, Frank Wolfe, R. J. Myers, F. W. Dye.



G. M. C. Gasoline Truck Equipment of M. A. Newmark & Co., a Los Angeles Wholesale and Importing Firm.

Chico Garage Company, Chico, Cal.; $10,000; general automobile business; incorporators, S. P. McLerran, T. H. Morgan, E. S. Sauber.

Cragg Motor Manufacturing Company, Detroit; $4000; to make motors and accessories; incorporators, E. F. Alleman and others.

South Texas Traction Company, Houston, Tex.; $20,000; to manufacture gasoline motors; incorporators, A. E. Hall, John A. Owen, C. H. Hall.

Adix Automobile Company, Chicago; $2500; general automobile and garage business; incorporators, Percy L. Adix, Jacob Rothschild, George H. Rees.

Hanna Motor Manufacturing Company, Kansas City, Mo.; $60,000; incorporators, John M. Hanna, Frank A. Hanna, Roy J. Hanna.

Harrisonburg Garage, Harrisonburg, Va.; $25,000; incorporators, John N. Garber, J. J. Hawse, H. L. Furr.

Blacklock Tire & Rubber Company, Birmingham, Ala.; $3000; incorporators, H. Blacklock, H. H. Bostick, K. Blacklock.

Starr Garage, Camden, N. J.; $50,000; general automobile business; incorporators, F. L. Starr, H. H. Grace, T. P. Curley.

The Cartercar Sales Company, Youngstown, O.; $10,000; to handle automobiles and trucks in new garage; incorporators, William Beight and others.

Amper Electric Company, Lockport, N. Y.; $25,000; to manufacture automobiles and automobile locks; T. D. Robinson, E. W. Jones, C. L. Nichols.

Millar Supply Company, Jersey City, N. J.; $100,000; general automobile business; incorporators, J. A. Duffy, W. C. Marley, M. E. Thornton.

Usher Automatic Stop Company, Chicopee, Mass.; $15,000; incorporators, Frank D. Howard, Frank H. Page.

Durable Tread & Automobile Sales Company, Inc., New York City; $10,000; incorporators, Henry A. Deimel, Samuel M. Winkler, Rose H. Jacobs.

Carron & Co., Inc., New York City; $20,000; automobiles; incorporators, Arthur L. Carron, Herman Behr, Karl H. Behr.

S & M Motor Company, Inc., New York City; $10,000; to deal in automobiles, etc.; incorporators, Edward E. Strobel, Walter C. Martin, Richard W. Freedman.

Motor Trading Company, New York City; $10,000; incorporators, William A. Shappard and others.

The Foreign & Domestic Automobile Repair Company, New York City; $10,000; to deal in automobiles, aeroplanes, etc.; incorporators, L. O. Rothschild and others.

F. W. Offeldt & Sons, New York City; $20,000; to deal in motor trucks, etc.; incorporators, Edward Y. Eltonheed and others.

Morristown Auto Company, Morristown, N. J.; $25,000; general automobile business; incorporators, J. J. Lyons, I. Van Gaasbeek, A. Newmark.

Electric Coach Corporation, New York City; $500,000; to manufacture and engage in the motor vehicle business; incorporators, John Larkin, Alexander S. Andrews, Ralph S. Hull, Ralph A. Gamble, Richard J. Lynch, A. J. Doty, A. F. Bennett, E. R. Holmes.

Ball, Washburne Motor Company, Inc., Rochester, N. Y.; $25,000; incorporators, Ward H. Ball, Charles H. Washburne, Asa R. Ball.

Norwalk Motor Car Company of New England, Boston; $75,000; automobiles, etc.; incorporators, C. C. Smith, J. W. Briggs, M. A. Beaudet.

Nolan Bros. Motor Truck Company, Memphis, Tenn.; $10,000; incorporators, J. W. Dickson, W. S. Anderson, E. E. Rucker, E. H. Gerber, L. C. Nolan.

T. J. Moss Motor Car Company, 4374 Olive street, St. Louis, Mo.; to place firm on corporate footing; T. J. Moss, J. W. Fristoe, E. J. Dykstra.

John Ehlers & Co., Minden, Ia.; $12,000; John Turk, John F. Reimers, John Ehlers.

Veerac Motor Truck Company, Inc., New York City; $10,000; Harry B. McGinley, Edward L. Whittemore, George H. Hinnau.

New Columbia Automobile Company, Columbus, O.; $30,000; to manufacture motor vehicles; Jesse J. Brown, Lillian M. Brown, William E. McConnon, Charles E. Dennis, Edson E. Dennis.

Peru Tire & Rubber Company, Peru, Ind.; $25,000; to deal in automobile tires; C. E. Miller, Oliver J. Tillett, Ira H. Stanter, J. Miller.

State Motor Car Company, Memphis, Tenn.; $25,000; W. F. Anderson, R. M. Meriges, Jr., John A. Weisdorf, John E. Shelton.

Dufay Tire Filler Company, Chicago; $1000; to make and sell compound for filling tires; Joseph C. Fuhs, W. T. Lostetter, Lebelm Wheeler.

Jarvis-Huntington Automobile Company, Huntington, W. Va.; $100,000; to manufacture and sell automobiles and motor trucks and operate garage; Mrs. R. J. Hoster, G. G. Hoster, R. D. Seaman, T. L. Millard, F. C. Fifer.

Northern Automobile Company, Indianapolis, Ind.; $10,000; to deal in automobiles; J. J. Clements, R. M. Fleming, L. H. Van Briggle.

LaCroix Automobile Company, New Orleans, La.; $7500; to conduct garage and sell automobiles; Samuel J. Wolf, L. J. LaCroix, P. G. LaCroix.

Fitzgibbon & Crisp, Inc., Trenton, N. J.; $100,000; to manufacture carriages, wagons, automobiles, etc.; L. L. Woodward, W. F. Smith, Joseph Williams, Jr.

International Filter Company, Denver, Col.; $100,000; to manufacture gasoline filters for automobiles, motorcycles and gas engines; E. D. Motz, John N. Stewart, H. W. Kirby.

Willets Service Company, Inc., New York City; $50,000; motor vehicles and trucks; William C. Willets, Marius Jurgensen, Estelle M. Naylor.

United Auto Association, Los Angeles, Cal.; $10,000; H. W. Bohrman, Burt Dequine, C. L. Robinson.

Ross Ketchum Company, Inc., Saratoga Springs, N. Y.; $18,400; automobiles and bicycles; J. Arthur P. Ketchum, Norman B. Ross, James W. Northrup.

Hudson-Phillips Motor Car Company, St. Louis, Mo.; $10,000; to manufacture, sell and repair automobiles and trucks; C. F. Phillips, J. H. Phillips, J. E. Stewart.

Overland-Winton Sales Company, Worcester, Mass.; $10,000; George F. Fuller, Harlan T. Pierpont, Jay Clark, Jr.

W. C. Bates Company, Boston; $10,000; William C. Bates, William J. Munday, George A. Kersley.

Kingsbury Motor Sales Company, Inc., Hudson Falls, N. Y.; $10,000; Earle H. Wells, Esther L. Wells, Leonard Wetsell.

K. & K. Motor Car Company, Inc., Richmond, N. Y.; $10,000; Lillian E. Killian, Agnes E. Killian, Frank B. Killian.

Carels Diesel Motor Company of America, Wilmington, Del.; $10,000,000; H. E. Latter, W. J. Maloney, N. P. Coffin.

Capitol Body Company, Indianapolis, Ind.; $10,000; to manufacture and sell automobile tops and fenders; Elmer Hinshaw, Fred W. Heaschen, Elmer W. Hughey.

Brookville Auto Company, Brookville, O.; $10,000; sales, garage and repairs; J. Ward Somers, Edward B. Somers, V. T. Somers, John E. Somers, Anna Somers.

H. M. S. Motor Company, Inc., New York City; $22,500; motors and engines; Charles K. Starr, Joseph J. Myers, George P. Harvey.

Savoie Tire Company, Providence, R. I.; $100,000; Joseph Savoie, Edward C. Clines, Harry D. Reed.

Aquaero Manufacturing Company, New London, Conn.; $60,000; aeroplanes; Henry R. Bond, Jr., Edward C. Hammond, P. Leroy Harwood.

Norwood Garage, East Orange, N. J.; $10,000; Walter C. Jacobs, Dwight R. Davies, Louis Boehme.

National Garage Company, Cleveland, O.; $20,000; John A. Nally, C. A. Gardner, George L. Williams.

Pierce Speed Controller Company, Anderson, Ind.; $25,000; to manufacture and sell speed indicating and speed controlling devices; George W. Pierce, F. E. Mustard, U. M. McCullough.

Automobile Protective Association Company, Columbus, O.; $5000; guarding owners against theft of automobiles or parts thereof; William Lester, Mark A. Caputo, R. M. Switzer, E. L. Richards, A. M. O'Harra.

Chicago Original Auto Polo Company, Chicago; $6000; dealing in automobiles and operating places of amusement; Joseph R. Deahl, Frederick W. Moore, Marie C. Suhr.

Parsons Manufacturing Company, Toledo, O.; $10,000; to manufacture automobile appliances, novelties, etc.; George R. Seney, Irvin E. Austin, Charles W. Parsons, Henry T. Parsons, Helen W. Keler.

Walker-Wells Company, Inc., Amesbury, Mass.; $25,000; to manufacture automobile bodies; H. P. Wells, J. H. Walker, H. Miller.

Franco-American Safety Tire Company, Philadelphia, Penn.; $100,000; Emile LeFevre, Eugene Wolf, Armond Gallard.

Central Motor Supply Company, Inc., Rochester, N. Y.; $20,000; Percy D. Baragoi, Robert F. Close, William Wood.

Craig Transfer & Motor Car Company, Inc., New Castle, Va.; $2000; M. C. Royden, W. W. Johnson, J. P. Jones.

Newkirk Avenue Automobile Company, Inc., Brooklyn, N. Y.; $5000; Jennie Hunton, William Backus, W. D. Maxwell.

The Club Garage, Inc., New York City; $5000; Jerome L. Davis, Thomas A. Kilfoil, Samuel I. Goldberg.

Valley Rapid Motor Company, Wilmerding, Penn.; $5000; John Genre, Dominick Genre, H. F. W. Rentzel.

Waynesboro Automobile Company, Waynesboro, Va.; $5000; B. E. Watson, J. B. Young, H. M. Hanger.

No Shock Wheel Company, Inc., New York City; $400,000; to deal in automobile supplies; J. W. Ebbs, R. H. Waddell, A. A. Kelley.

Par-Kul Wheel Company, Camden, N. J.; $100,000; automobile business; E. S. Muzzey, F. S. Saurman, F. A. Kuntz.

Dawson Automobile Company, Decatur, Ill.; $10,000; taxicab, automobile and baggage delivery business; Earle M. Dawson, Charles E. Dawson, Florence L. Dawson.

Lincoln Motor Sales Company, Los Angeles, Cal.; $30,000; B. F. Taylor, Edmund Locke, J. A. Meeks.

Union Auto Livery Company, Chicago; $2500; Vernon E. Weyght, Walter Grunnet, Charles Perksen.

Gladwell-Crossley Motor Company, Lima, O.; $10,000; A. J. Gladwell, C. C. Crossley, F. A. Holland, H. I. Bland, J. W. Roby.

Auto Center, Inc., New York City; garage business; $25,000; E. W. Forrest, C. H. Fuller, B. C. Thomas.

Ravenna Motor Truck Company, Ravenna, O.; $200,000; manufacture and sale of trucks; W. F. Travos, A. N. Knuth, H. Schwartz, L. N. Mackenzie, C. O. Liggett.

Peabody Square Garage Company, Boston; $5000; John T. Duke, J. J. O'Keefe, M. A. Duke.

George C. Brinkman Motor Car Company, St. Louis, Mo.; $5000; George C. Brinkman, Phyllis M. Brinkman, Benjamin G. Brinkman.

Lillie Garage Company, Chicago; $2500; T. B. Lillie, E. Lillie, Mrs. T. B. Lillie.

Whittlesey Garage & Machine Company, San Benito, Tex.; $25,000; C. W. Whittlesey, James T. Valentine, J. F. Valentine.

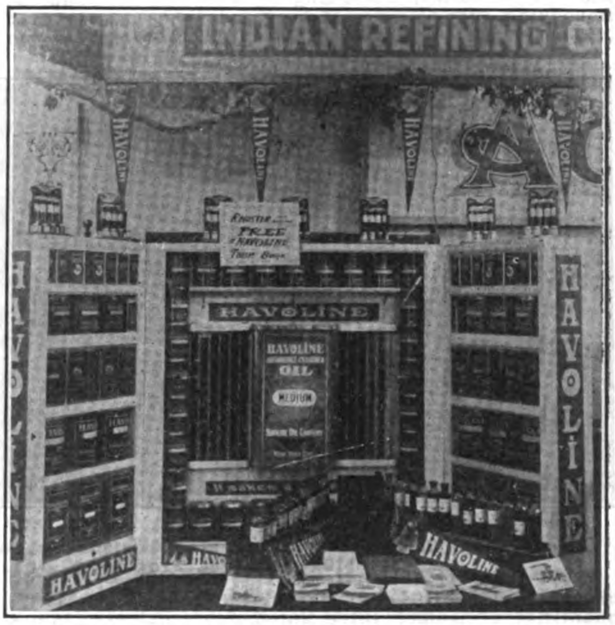
National Tire & Repair Company, Chicago; $3000; William C. Erkert, E. H. Tillson, Paul H. Ringo.

Auto Service Company, Uniontown, Penn.; $5000; C. W. Johnson, Fred A. Close, F. B. Hess, R. M. Campbell, Max Hannan, E. Gadd Snyder, J. C. Donahue, G. T. Love, D. D. Haroder, A. E. Corns.

WITH THE MANUFACTURERS.

The Republic Rubber Company, Youngstown, O., maker of Republic tires, has leased the building at 2018-20 Locust street, St. Louis, Mo., to be used as a branch for the company's product. George M. Hoffman, who has been manager of the solid tire department at St. Louis, is manager of the new branch, which will combine the solid tire with the pneumatic tire business.

The Indian Refining Company, 17 Battery place, New York City, maker of Havoline oils, has taken advantage of the opportunity offered by local shows throughout the country to bring its product more directly to the attention of the motoring public. An accompanying illustration presents the exhibit prepared for this purpose, and it may be added that the large can and the name Havoline in the centre are transparent and illuminated, making a decidedly attractive display.



Havoline Oil Company Utilized by Indian Refining Company at Local Shows Throughout the Country.

The R-C-H Corporation, Detroit, has appointed the following agents to handle R-C-H cars in their respective territory: Cowles Tolman, New Haven, Conn.; D. B. Dalzell, Iliff, Col.; Hood & Currie, Bond, Miss.

M. A. Newmark & Co., a large wholesale and importing firm in Los Angeles, Cal., is utilizing 11 G. M. C. trucks, made by the General Motors Truck Company, Pontiac, Mich., which have replaced a large number of horses and wagons. In order to secure the utmost efficiency from the equipment wheeled bins are used for loading in the warehouse of the company. These bins are transferred from and to the trucks with minimum loss of time, increasing the efficiency of the delivery system by at least 30 per cent., according to the estimate of the company.

The Motometer Company, Inc., 1784 Broadway, New York City, has opened a Chicago branch at 1322 Michigan avenue. R. G. Ames has been made manager.

The Oliver Motor Truck Company, Detroit, maker of Oliver trucks, is occupying the former Carhartt plant and will continue to make the 1500-pound light truck and the 3000-pound vehicle, which has been given a four-cylinder motor. The Oliver Motor Truck Company recently took over the assets of the Oliver Motor Car Company and the factory which it vacated has been sold to the Keeton Motor Car Company, maker of Keeton pleasure cars.

The Gray & Davis Company, Boston, maker of automobile lamps and electric lighting and starting systems, has placed a contract for a five-story reinforced concrete building to be erected in the parkway near the Cottage Farm bridge, on the Cambridge side of the Charles river. It will be ready for occupancy about July 1.

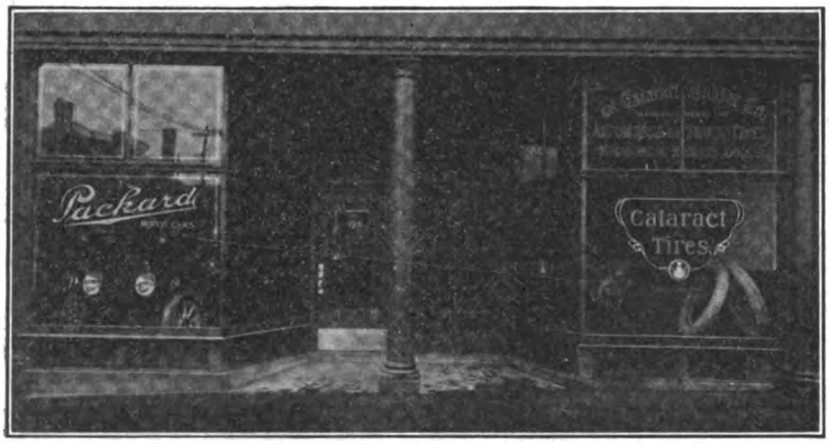
The Willys-Overland Company, Toledo, O., maker of Overland cars, is planning for the erection of a new five-story administration and general office building to cost $150,000.

The Scharf Gearless Motor Company, Richmond, O., recently incorporated, is planning for the erection of a plant for the manufacture of its new motor.

The Garage Equipment Manufacturing Company, Milwaukee, Wis., which recently suffered a setback by reason of a serious fire, has secured a permit to construct an addition to its plant to cost $7500.

The Wilboken Manufacturing Company, Milwaukee, Wis., recently formed, has established its factory and headquarters at 248 Reed street. The company will make air compressors for automobiles, electric air compressors for garages and a line of mechanical specialties.

The Lyons Atlas Company, Indianapolis, Ind., which owns and controls one of the four American Knight licenses and which is now manufacturing the Lyons-Knight sleeve valve engines, has purchased the sample cars, parts, drawings and patterns of the Atlas Motor Car Company, Springfield, Mass., maker of the Knight-Atlas cars, which were designed, developed and thoroughly tested out during the last 18 months by Harry A. Knox of Springfield, who was president of the Atlas company. Mr. Knox has located at Indianapolis and will have charge of the automobile work at the Lyons Atlas plant. The Lyons Atlas Company recently purchased the extensive plant of the former Atlas Engine Works of Indianapolis, embodying over 65 acres of land and 627,000 square feet of floor space. In addition to the Knight engine the company makes Diesel stationary oil engines, also large quantities of poppet valve automobile engines. James W. Lyons, president of the Lyons Atlas Company, states that a large part of its extensive plant will now be utilized for the manufacture of complete Lyons-Knight four and six-cylinder cars.



Rhode Island Branch of Cataract Rubber Company, Wooster, O., at 200 Washington Street, Providence, R. I.

The Rapp Manufacturing Company, Toledo, O., maker of Visco spark plugs, has changed its corporate name to the Toledo Spark Plug Manufacturing Company, and is occupying the new Manufacturers' building. In addition to the well known Visco plug, so constructed as to show at a glance ignition trouble, the company will build a new spark plug to be known as the Ohio, without the visible spark gap seen in the Visco, in large quantities. It is also entering the motorcycle and marine engine field and a number of plugs for these engines has already been turned out.

The Planhard Manufacturing Company, Kokomo, Ind., maker of Planhard carburetors, has appointed through E. H. Stickles, its New York sales manager, the Eisner-Lenk Company of 1074 Boylston street, Boston, distributors for the Planhard carburetor for the entire New England territory. This firm is well known to the trade and will inaugurate an aggressive sales policy.

The United States Tire & Rubber Company has opened a new branch house at Commonwealth avenue and Beacon street, Boston, which is under the management of E. H. Kidder.

The K. & W. Manufacturing Company, maker of tire accessories, has opened a factory branch at 2362 Euclid avenue, Cleveland, O. G. W. Hovey is in charge.

The Willys-Overland Company, Toledo, O., has announced that it will invest an additional $800,000 in the common stock of the Garford Company, Elyria, O., a subsidiary. The capacity of the plant will be increased from six to 15 trucks a day.

J. V. Mowe, well and favorably known among many in the automobile industry, has become a member of the sales force of the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires.

The Union Top Manufacturing Company, Pittsburg, Penn., has been granted a charter to manufacture and deal in tops, bodies and accessories for automobiles, boats, etc. The incorporators are: John R. Young, James Milholland and Lyman C. Shreve of Pittsburg.

The Thompson-Breese Auto Plow Company, Wapakoneta, O., has been purchased by John Breese, a member of the firm, and the plant is being enlarged. The firm name has been changed to the Breese Motor Plow Company and will manufacture a self-contained tractor and plow carrying three bottoms. The power will be furnished by a gasoline engine and the tractor and plows can be operated by one man.

Harry J. Galvin, for several years chief accountant and later auditor of the Remy Electric Company, Anderson, Ind., has resigned to become president and general manager of the Galvin Specialty Company, a new concern organized at Anderson, which will manufacture and market gas machines for heating, garment pressing and laundry work. In the new company with Mr. Galvin will be associated W. R. Poland, formerly general manager of the Remy Electric Company, and others. Previous to Mr. Galvin's association with the Remy company he was connected with the plate glass industry at Kittanning, Penn.

The Bosch Magneto Company, New York City, announces that the W. G. Nagel Electric Company, Toledo, O., has been appointed a distributor for the Bosch magnetos. The Nagel company carries a complete stock of Bosch magnetos, spare parts, spark plugs, etc., and maintains a specially equipped shop in charge of trained mechanics for the proper installation and adjustment of Bosch ignition apparatus.

E. J. Samuel, who was in charge of the publicity department of the Goodyear Tire & Rubber Company, Akron, O., has been promoted and will be manager of the advertising department of the Goodyear Tire & Rubber Company, Ltd., of Great Britain, with headquarters at Central House, Kingsway, W. C., corner Kemble street, London, England.

The Cataract Rubber Company, with factory in Wooster, O., has opened a factory branch for Cataract automobile and truck tires at 200 Washington street, Providence, R. I. Patrons in Rhode Island will be served by this office. An illustration of the new salesrooms is presented herewith.

The Fisk Rubber Company, Chicopee Falls, Mass., will on Feb. 1 open a completely equipped branch house at 307 Fort street, Winnipeg, Manitoba, Canada. A full line of Fisk tires and tire accessories will be carried. The increased demand in Canada for Fisk tires made it advisable to open the branch, which will be one of the most completely equipped of any in the Dominion. R. Phillips will be in charge as manager.

John N. Willys, president of the Willys-Overland Company, Indianapolis, Ind., maker of Overland cars, has been elected president of the Gramm Motor Truck Company, Lima, O., builder of Gramm trucks. Mr. Willys announces that the plant will be increased and in addition to the one-ton trucks now being produced a new 1500-pound model will be made. H. H. Doehring, for several years general sales manager of the Ohio Electric Car Company, Toledo, O., has been appointed sales manager of the Gramm Motor Truck Company.

The Schacht Motor Car Company, Cincinnati, O., maker of Schacht cars, recently held an election of directors at a meeting of its stockholders, with the following results: G. A. Schacht, William Schacht, Harry G. Pounsford, A. O. Elzner, John F. Dietz, John H. Miller and Arthur Stem.

The Vanguard Manufacturing Company, which has been building for some time at Detroit, preparatory to removing from Joliet, Ill., is now in its new plant with a capacity for 1000 windshields a day.

The Bowling Green Motor Car Company, Bowling Green, O., maker of light motor trucks, has voted to double its capitalization from $100,000 to $200,000.

The Anderson Electric Car Company, maker of the Detroit electrics, has opened a new factory branch at 903 Boylston street, Boston. A service station is also located in the same building which is equipped with every facility for the maintenance of the high quality of service extended to all Detroit electric owners.

The Cole Motor Car Company, Indianapolis, Ind., maker of the Cole cars, has appointed the following distributors: F. A. Wilson, Amherst, N. S., Canada; J. P. Krall, Avon, S. D.; Davis Sparger Auto Company, Bristol, Tenn.; A. V. Hunt, Clarinda, Ia.; LaFayette Motor Car Company, Easton, Penn.; Serfas Motor Car Company, Lehighton, Penn.; Swanson Bros., Lyons, Neb.; Thomas Mabon, Northfield, Neb.; Pink, McVerty, Blackburn Company, Ottawa, Ont., Canada; G. Williams & Bros., Poplar Bluff, Mo.; Chamberlain Bros., Salem, Ore.; Trenton Motor Car Company, Trenton, N. J.; Baehr Bros., Wadena, Minn.; Morgan & Williams, Warren, O.

The R-C-H Corporation, Detroit, maker of R-C-H cars, has appointed the following managers of newly established branches: J. D. Palmerlee, 548 Peachtree street, Atlanta, Ga.; C. E. Wheeler, 563 Boylston street, Boston; R. W. McMullen, 1225 Main street, Buffalo, N. Y.; H. E. Westerdale, 2021 Michigan avenue, Chicago; A. D. Caldwell, 2122 Euclid avenue, Cleveland, O.; E. W. Swanbrough, 1520 Broadway, Denver, Col.; M. D. Davidson, Jefferson and Lycaste streets, Detroit; E. E. Guthrie, 3501 Main street, Kansas City, Mo.; J. W. McCrea, 1242 Hennepin avenue, Minneapolis, Minn.; W. S. Jewell, 1989 Broadway, New York City; E. N. Stimson, 330 North Broad street, Philadelphia, Penn.; A. E. Morrison, 819 Ellis avenue, San Francisco, Cal.; Don J. Campbell, Walkerville, Ont., Canada.

The Timken Roller Bearing Company, Detroit, is constructing a new factory for the grinding of the cups, cones and rollers used. The plant will be 64 by 120 feet and will cost $100,000.

Herbert Hughes, for the past six years with the Packard Motor Car Company, Detroit, maker of Packard cars, has joined the sales organization of the Buick Motor Company, Flint, Mich., producer of Buick machines. He sailed from New York Jan. 22 for London to assume charge of European sales. Mr. Hughes was manager of Packard sales in Paris for two years and for four years was with the company at Detroit.

The Stromberg Motor Devices Company, Chicago, announces that the Indianapolis branch has been transferred to new quarters at 33 West Michigan street.

Harry C. Tillotson, formerly a director and treasurer of the McDuffy Automobile Company, is now a director and secretary of the Stromberg Motor Devices Company, Chicago, maker of carburetors and motor accessories, and in addition to the active duties of secretary he will have personal supervision of the sales.

W. Haddon Jenkins has resigned as advertising manager of Motor Print to become merchandising expert for the McManus company's advertising agency in Detroit. Mr. Jenkins gained his first experience with the Ireland agency of Philadelphia and was later branch manager for Albert Frank & Co., going from there to the J. Walter Thompson Company, which he left in 1910 to become advertising manager of Motor Print.

Frank E. Smith, for the past three years general manager of the Maxwell-Briscoe Motor Company's plant at Newcastle, Ind., will sever his connection with that plant and with the company as soon as the United States Motor Company, of which the company is a part, is completely reorganized. It is expected that Mr. Smith will announce his plans for the future soon.

The Remy Electric Company, Anderson, Ind., manufacturer of the famous Remy magneto, announces it has discontinued the Indianapolis branch; owing to the proximity of Anderson to that city it has been found more expedient to care for Remy users directly from the service department of the company located at the home office. E. L. Jones, manager of the Indianapolis branch for the past two years, will continue with the company at the Anderson office.

The Metal Body Tank & Fender Company, 414 Canal avenue, Cleveland, O., has been obliged to enlarge its space and manufacturing facilities and is moving to Payne avenue and East 17th street. The company has recently taken a large contract for automobile bodies that cannot be executed in the present quarters.

The Ford Motor Company, Detroit, Mich., maker of Ford cars, recently purchased a piece of property in St. Paul, Minn., on University avenue, upon which to erect a suitable garage and salesroom to handle the retail trade of St. Paul. The property cost $10,000 and as soon as possible a suitable two-story building will be erected. In Minneapolis, Minn., the company is building an extensive assembly plant and warehouse which, when completed, will be occupied also as a salesroom, garage and warehouse for the handling and distributing of Ford cars throughout the Northwest.

H. M. Denyes of the technical department of the Buick Motor Company, Flint, Mich., maker of Buick cars, has become chief engineer of the Jackson, Church, Wilcox Company of Saginaw, Mich. The concern manufactures the Jacox steering gear and is in the General Motors group. Mr. Denyes has been with the Buick company for the past three years.

The Kissel Motor Car Company, Hartford, Wis., maker of KisselKar and pleasure cars and trucks, has appointed the following agencies: Dominion Motor Machine Company, Medicine Hat, Alberta, Can.; J. L. Maddux, Taft, Cal.; C. C. Eichelberger, Oakland, Cal.; Short's garage, Dwight, Ill.; H. G. Raymond, Fort Wayne, Ind.; Charles H. Lantz, Manhattan, Kan.; Bishop & Chero, Iron River, Mich.; Ball Auto Company, Fargo, N. D.; Alpine Motor Company, Pittsburg, Penn.; J. W. McKee, Sherbrooke, Quebec, Can.; Rydell & Hokenson, White Rock, S. D.; Percival & Silsby, St. Johnsbury, Vt.

Hess & Son, successor to The American Tinol Company, Philadelphia, Penn., has located its offices and salesrooms in the Watkins building, 1031 Chestnut street. A complete stock of Tinol in all forms will be kept on hand.

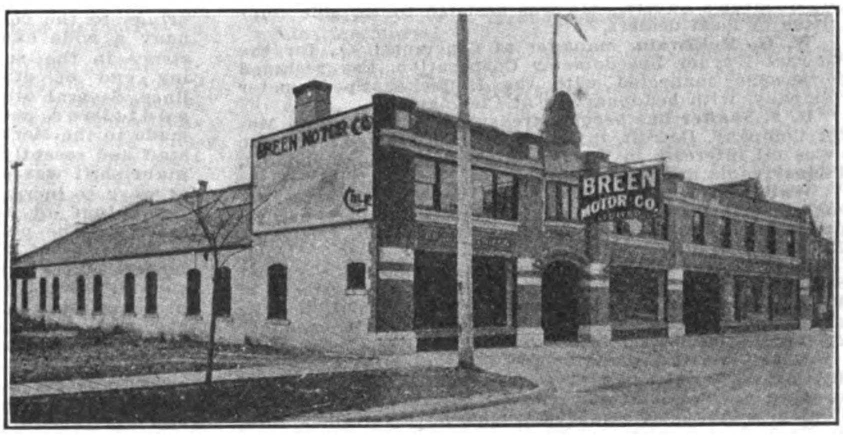
TRADE PERSONALS.

Harry S. Houpt has resigned as general sales manager of the automobile department of the American Locomotive Company, New York City. He has not been in good health for some time and he has left for a trip through the South.

J. J. Cole, president of the Cole Motor Car Company, Indianapolis, Ind., maker of Cole cars, is making a trip through the entire West in order to personally familiarize himself with actual trade conditions, repeating a similar trip made through the East last year.

The Breen Motor Company, Broadway and Sherbrooke street, Winnipeg, Manitoba, is agent for Cole cars, made by the Cole Motor Car Company, Indianapolis, Ind., in that section of Canada. The accompanying illustration indicates the size of the present quarters which are held to be decidedly too small, and arrangements are under way for the erection of a substantial addition.

William L. O'Neil, formerly manager of the New York office of the Stromberg Motor Devices Company, Chicago, has been appointed manager of the Detroit office and will have charge of the business in Michigan, Ohio and Canada. His place at New York has been taken by R. B. Whitman, formerly connected with the Bosch Magneto Company.



Exterior of the Cole Agency in Winnipeg, Manitoba, Held by Breen Motor Company.

Ernest C. Cox, formerly connected with the Texaco Oil Company, as sales manager, has been appointed manager of the eastern sales and service branch of Findeisen & Kropf Manufacturing Company, Chicago, maker of the Rayfield carburetor.

Sales Manager Paul Smith of the Lozier Motor Company, Detroit, maker of Lozier cars, has announced the appointment of H. W. Miller to the sales organization of the company. Mr. Miller was formerly connected with the Studebaker Corporation.

Gerald M. Murphy has severed his connection with the Splitdorf Electrical Company, Newark, N. J., maker of Splitdorf magnetos. As assistant treasurer for C. F. Splitdorf, Inc., for seven years Mr. Murphy was well known throughout the executive departments of the automobile industry.

O. R. Wolf has been appointed factory representative and territory manager of the Central States district for the Henderson Motor Car Company, Indianapolis, Ind., maker of Henderson machines.

A. J. Diefenderfer has been appointed manager of the New York branch of the Lozier Motor Company, Detroit, succeeding W. J. Mead, whose assistant he formerly was.

C. M. McCreery, manager of the Boston branch of the Goodyear Tire & Rubber Company, announces that Frank B. Sullivan is now in charge of the sales of the motor truck tire department.

Harry L. Bill, former production manager of the Chalmers Motor Company, Detroit, and later general manager of the Metzger Motor Car Company, and then of the Tudhope Motor Car Company of Orilla, Can., Canadian maker of the Metzger cars, has become manager of manufacturing for the Ignition Starter Company, Detroit.

Thomas I. Cochran has achieved an enviable reputation as a show manager, largely because of his success with previous automobile displays at Pittsburg, Penn. This year's recent third annual show of the Pittsburg dealers in the Exposition building far surpassed all previous exhibitions of the kind held in the Smoky City and this was in a large measure due to the hard work of Mr. Cochran, who began his preparation early in the present year. Pittsburg is the centre of a population roughly estimated at 5,000,000, so that the task of arranging a motor exhibition that would appeal to this clientele was no small matter. The attendance this year was the largest in the history of Pittsburg shows and many were the expressions of congratulation at the success of Mr. Cochran's efforts. He was assisted by an able committee of local dealers.

Thomas I. Cochran, Manager, Pittsburg Automobile Show.

W. G. McElwain, manager at Cincinnati, O., for the Stewart-Warner Speedometer Corporation, has resigned to become connected with the Hoffecker Speedometer Company, with headquarters at Cleveland, O.

H. S. Shaffer has become treasurer of the Keeton Motor Company, Detroit, in which he is interested. He also owns oil interests in Texas, Oklahoma, Illinois, Indiana, Pennsylvania and West Virginia.

Walter H. Wood of Chicago, formerly of the advertising department of the Chicago Examiner, has become publicity manager of the Moline Automobile Company, East Moline, Ill.

C. B. Smith, general manager of the Stewart-Warner Speedometer Corporation, announces the appointment of Frank Martin as eastern manager; Berne Nodall to take charge of the engineering staff, and R. Baldwin, manager of the Detroit branch.

J. V. Carr, salesman for the State of Michigan; John R. Carr, city salesman at Detroit, and J. B. Bray, purchasing agent, all of the Alden Sampson Manufacturing Company, maker of Sampson trucks, have resigned.

E. A. Scheu, who was the first agent for Invader oils in Boston, will remain in charge of that branch of the Invader Oil Company, the new name of the old firm of Chas. F. Kellom & Co., Philadelphia, Penn., which has been acquired in part by T. E. Tomlinson, who organized the Havoline Oil Company and who will direct the sales end of the new firm, Mr. Kellom remaining at the head. The company formerly maintained only the Boston branch, but a Chicago branch will soon be opened. Mr. Scheu was from 1903 until he became agent for the oil, connected with the Packard Motor Car Company and the Boston Packard agency. He has developed his oil business greatly and his knowledge of the New England trade is very extensive. He has perfected plans for the better distribution of Invader oils and is now a stockholder in the company. He will travel New England this season by car and will be in close touch with the representatives of the company.

E. A. Scheu, Manager, Boston Branch, Invader Oil Company.

George L. East, formerly director of advertising of the Olds Motor Works, Lansing, Mich., and later with the Amplex Motor Car Company of Mishawaka, Ind., has joined the publicity staff of the Timken Roller Bearing Company and the Timken-Detroit Axle Company, as assistant advertising manager.

William R. McCulla has taken a position as assistant research engineer with the Packard Motor Car Company.

Dr. Charles G. Percival of New York City, well known automobile publicity man, is said to be arranging another trip similar to the 50,000-mile journey he made in the Abbott-Detroit "Bull Dog." Previous to his proposed trip he will go to Havana, Cuba, Yucatan, Mexico and through the southern states.

T. H. McGiehan, who for three years has represented the Goodyear Tire & Rubber Company at New Orleans, La., has become assistant manager with the Motz Tire & Rubber Company, Akron, O.

H. S. Stebbins, formerly general traffic manager for the General Motors Company, and eastern district manager for G. M. C. trucks, is now associated with the S. G. V. Company of Reading, Penn., as vice president and treasurer.

E. W. Arbogast, manager of the commercial car division of the Chicago branch of the Studebaker Corporation, Detroit, has been made manager of the commercial division in the entire territory controlled by the Chicago branch.

H. H. Robinson, chairman of the runs and tours committee of the Wolverine Automobile Club, Detroit, has been appointed assistant to W. G. Houck, general sales manager of the Keeton Motor Company, Detroit.

H. Cameron Forster has been appointed to take charge of the sales department of the Miami Cycle & Manufacturing Company, Middletown, O., maker of Merkel motorcycles, and he brings to the company a wide experience in the selling end of other lines. Several other additions were made to the Merkel staff and recently a night shift was put at work to increase the output of the factory. The plant is now one of the busiest in the country and the present demand for the product is such that the company plans to double its capacity. The addition of Mr. Forster is assurance that the sales will greatly increase and the prospects for big business were never brighter.

H. Cameron Forster of the Flying Merkel Sales Department.

Fred W. Ellis has joined the advertising department of the Imperial Wheel Company, Jackson, Mich.

NEW CONCERNS AND PROPRIETORS.

B. D. Springs & Co., a well known firm of Charlotte, N. C., was recently dissolved, when B. D. Springs purchased the holdings of his active partner, E. T. Stenerson, and also of Eli B. Springs, a silent partner. Mr. Stenerson has purchased the Charlotte Motor Car Company and will have entire charge of that concern. E. B. Springs, who also was a silent partner in that company, has retired.

The Holsman Sales Company, Des Moines, Ia., has been organized and closed contracts for the State of Iowa for the King machine, made by the King Motor Car Company, Detroit.

The Union Automobile Company, Wheeling, W. Va., is a new concern organized to handle the Abbott-Detroit cars, made by the Abbott Motor Company, Detroit. William F. Shaffer, secretary and treasurer of the Packers Motor Truck Company of the same city, was one of the organizers. Others were A. C. Shaffer, George P. Folmar, Albert M. Schenk.

The Brookes Auto Company, Steubenvile, O., has purchased the Automobile & Motor Boat Company of that city, which has been placed in charge of O. L. Marquert, who will have the agencies of the Cadillac pleasure car and the Kelly-Springfield and Chase trucks. The new owner will add the Studebaker and Michigan cars, besides the Lippard-Stewart trucks.

The Des Moines Auto Supply Company, a newly organized accessory concern, has leased quarters at 1007 Locust street, Des Moines, Ia. The new firm was organized by A. G. Bigelow, who is president, and B. O. M. Bonebrake, secretary and treasurer.

The Maykel Automobile Company of Worcester, Mass., has been formed with a capital stock of $12,500, and has occupied a garage on Vine street, formerly occupied by the Worcester Automobile Company. The officers are: President and treasurer, Mitchell K. Maykel; clerk, Maurice L. Kats. With Anthony Massad these form the board of directors.

The Hagerstown Garage Company, Hagerstown, Md., has sold to the Maryland Garage Company all its materials and possessions in the building on West Franklin street and has taken an office in another building, where M. I. Patterson will look after the Pullman and Regal agencies. The new company is composed of Dr. R. G. Stevenson, David Stockslager and others.

The Van Brunt Automobile Company, Omaha, Neb., has moved into larger quarters at 2010 Farnam street. The company handles the Overland and Pope-Hartford and the Ohio electric.

Irving Stern of Stern Bros., New York City, has leased the garage at 164 East 77th street of the L. J. Bloomingdale estate.

J. W. Leavitt & Co., Salt Lake City, Utah, agent for the Overland car, made by the Willys-Overland Company, Toledo, O., has moved into its new quarters at 1235 South Olive street. L. V. Starr is local manager for the Leavitt company.

J. Peshkin has leased the three-story garage at 113 East 77th street, New York City, of William Wolff's Sons, acting for the Christian Creamer estate.

Clark G. Powell, who managed the very successful Omaha automobile show at Omaha, Neb., is an enterprising dealer in supplies in that city. He is a recognized authority on all matters pertaining to the automobile industry and it is because of this knowledge that he was honored by his associates with the management of the annual automobile exhibit in his city. That their confidence was not misplaced is shown by the magnificent results obtained. Mr. Powell spent some time in Chicago during the recent national exhibit in that city and as a result manufacturers assisted the local Omaha dealers by sending several of the machines seen there for presentation at the show in the Nebraska metropolis.

Clark G. Powell, Manager, Omaha Automobile Show.

The W. D. Sweet Motor Car Company, a new concern organized at Binghamton, N. Y., has taken over the business of the W. A. Crandall Company of 233-235 Water street, and will make Binghamton the distributing point for Speedwell cars in Pennsylvania and New York territory. Mr. Crandall retains the machine and repair shop.

The Ross Garage Company and the Ketchum Garage Company, Saratoga Springs, N. Y., both large concerns, have been consolidated and the members of the new firm are: Norman B. Ross, J. A. P. Ketchum and J. W. Northup. It will handle the Packard and Hudson and the Detroit electric.

W. B. Hollander, formerly of the Hollander Motor Car Company of Boston, has opened salesrooms and a service station at 170 Fountain street, Providence, R. I., for the distribution and care of Metz cars in Rhode Island and a part of Massachusetts.

The Pueblo Auto Repair Shop & Storage Company, Pueblo, Col., has opened a new establishment at 521 Court street, that city, to be devoted exclusively to the repair and storage of automobiles.

Charles McAninch has rented property known as the Grabe mill at Silver City, N. M., and has opened an automobile repair shop.

Clifford Caley of Bluffton, Ind., has opened a new garage on Main street, Huntington, Ind., equipped to do all kinds of automobile work.

The Taunton Autogenous Welding Company, Taunton, Mass., has started business, making a specialty of automobile welding. Harry Carr is president and James Carr is superintendent.

Karl Winter, a well known automobile mechanic, has opened a repair plant at Eighth, South and State streets, Salt Lake City, Utah.

Stein & Unger of Elizabeth, Ill., has opened a garage on Front street, Warren, Ill. The Ford cars are carried.

E. E. Westman, who has been purchasing agent for the Cole Motor Car Company, Indianapolis, Ind., since October, 1909, has resigned to take a similar position with the Henderson Motor Car Company of that city. As a result of the move he will again be associated with J. M. Smith, formerly factory manager of the Cole company, who is now the Henderson factory manager. Mr. Westman has been regarded as an important factor in the success of the Cole, and before his connection with that company he held a responsible position with the Weston-Mott Company of Flint, Mich., for some time. The Henderson brothers were well informed of his ability through their close connection with the Cole factory organization during the life of the Henderson Motor Sales Company, which acted as Cole distributor for a number of years. His acquirement is another step to strengthen its organization.

E. E. Westman, Purchasing Agent, Henderson Motor Car Company.

Troth & Keen, Millville, Penn., which has conducted a livery stable, has sold its entire livery stock and replaced it with automobiles and motor trucks.

W. S. Jewell, formerly district manager for the R-C-H Company of New York, has been appointed sales manager of the Boston branch of the Kelly-Springfield Motor Truck Company. P. S. Aultman will continue as manager. The Boston branch of the Kelly-Springfield company is located in the Shoe & Leather building, Cambridge.

The Carlock Hardware & Implement Company at Carlock, Ill., has taken the agency for the Staver and Studebaker automobiles and has opened salesrooms and a garage in connection with the implement store.

The Norwalk Motor Sales Company, Chicago, has been organized by H. A. Stevens, who has opened a garage and salesroom at 4005-4007 Washington boulevard, for the exclusive sale of the Norwalk car.

William Blanchard, sales manager of the Lenox Motor Car Company, Boston, maker of Lenox cars, is thoroughly conversant with the construction of automobiles and this knowledge makes him of inestimable value to the company he serves. Mr. Blanchard has been connected with the industry for the past six years. He gained his first knowledge of motor cars with the Easton Machine Company, South Easton, Mass., maker of the Morse line, where he worked in every department, serving his full time at the bench and in the shop. It was while acting as salesman for the Morse cars that he was induced to join with the Lenox company in exploiting that line, and early in 1912 was promoted to become sales manager. In this position he has had much to do with the success of the Lenox Motor Car Company.

William Blanchard, Sales Manager, Lenox Motor Car Company.

The Crescent Garage, Goodsell and High streets, Evansville, Ind., has been opened by J. F. Griese and G.

M. Wilson, who are equipped to undertake all kinds of automobile repair work. They handle the Empire cars, made by the Empire Automobile Company, Indianapolis.

Factory Addition Recently Occupied by Flying Merkel Forces at Middletown, O.

Merley & Bryer has secured a part of the livery stable of Fink & Co., Aurora, Ill., and will convert it into a modern garage.

The Galveston Motor Car Company has entered the field at Galveston, Tex., and plans are being made for incorporation. R. S. Carter is general manager and the company has purchased of Fred M. Lege, Jr., the agency for the Studebaker cars.

W. H. Gilligan, Jr., recently resigned from the Morgan Garage & Supply Company, Rhinelander, Wis., and with Edward Priebe has opened a garage there.

R. S. Chase has opened a new garage at 642 State street, Springfield, Mass., and has a well equipped repair department, including paint room and a full line of supplies. He also has storage space.

The Arenz-Weihaupt Auto Company has been formed at La Crosse, Wis., the Weihaupt blacksmith shops being remodeled into a first class garage and repair shop. The Detroiter and Marathon are the machines for which agencies have been secured. The president and general manager is J. G. Weihaupt; vice president, George W. Weihaupt; secretary and treasurer, J. S. Arenz; head salesman, S. Bovee.

The Auto Accessories Company, Ft. Wayne, Ind., has been formed by J. M. Cramer, formerly manager of the Fort Wayne-Auburn Automobile Company. The new company will operate a wholesale automobile business and also a vulcanizing plant.

G. W. Jones, until recently general manager of the United Motors Des Moines Company, has secured a controlling interest in the Moyer Auto Company, Des Moines, Ia., which has the state agencies for the K-R-I-T and Hudson cars. W. E. Moyer, who went to New Mexico for his health, sold his business only a few days before his death.

J. C. McDonald and Joseph Atherton, proprietors of the M. & A. garage at Macomb, Ill., recently purchased the Stocker garage in the same place. They will continue both, although the M. & A. building will be used principally as a storehouse.

E. B. Grantham has purchased a half interest in the Granite City garage, Granite City, Ill. New machinery will be installed for all kinds of repair work.

The M-S-H Sales & Rubber Company, 660 North Broad street, Philadelphia, and the Meeley Tire House, 1335 Mount Vernon and 702 North Broad streets, and the Meeley branch at Washington, D. C., have been merged and will be conducted under the style of Meeley Rubber Company, Inc., with headquarters at 660 North Broad street. The officers of the new company are: President, George G. Meeley; vice president, John V. Harrigan; secretary and treasurer, Robert J. Skilton.

Arthur Parks has disposed of a half interest in his livery stable at Leland, Ill., to Ingval and Harvey Ericson. The new firm will soon open a garage.

The Peerless Garage, Fairfield avenue and Cannon street, Bridgeport, Conn., conducted by Richard J. Collins, has been fully equipped with a modern machine shop, in which adjusting, repairing and overhauling Ford cars, made by the Ford Motor Company, Detroit, will be made a specialty. The garage is large enough to care for all transient trade, having a storage capacity of 50 cars. Mr. Collins has handled Fords and been connected with Ford agencies since the establishment of the home factory.

The Lyman Dickey Garage, 107-109 Main street, Ottawa, Kan., has been sold to Troup Bros., comprised of motor car experts of Kansas City and Oswego. The members of the firm are Charles Troup, O. M. Troup and E. A. Troup.

Herbert R. Capron has leased a new building on Atwell's avenue, Providence, R. I., for use as a service station for Pope-Hartford cars. It will be used in conjunction with the present office and garage, at 69 Broad street, of the Rhode Island Motor Car Company, of which Mr. Capron is manager.

Arthur Jackson, formerly with the Mott Motor Company, and Guy Ginther of Lemmon, N. D., have purchased the Walter Smith garage at Mott, S. D., and have taken possession.

James M. Greenless, who the past season conducted the Shelburne Falls garage at Shelburne Falls, Mass., has purchased the business of J. W. Thurber.

NEW BUILDINGS AND REMOVALS.

The Miami Cycle & Manufacturing Company, Middletown, O., maker of Merkel motorcycles, has made substantial additions to its plant, as shown by the accompanying illustrations. One building is the office structure, which has just been occupied, while the other is the new factory wing. Both are of concrete and steel construction. The office building is said to be one of the most modern of its kind, while the factory addition affords excellent light and ventilation. With the facilities at hand it is now possible to manufacture 100 motorcycles a day.

The H. W. Neuman Machine Company, 308 East Second street, Davenport, Ia., is having a new garage building erected at Third and Ripley streets. The new place will be thoroughly equipped with modern machinery and automobile facilities.

The Packard Kansas City Company, Kansas City, Mo., possesses a new salesroom and service station at Robert Gillham road and McGee street. The company has a lease on the property with a purchase provision.

The Overland-Buffalo Company, Buffalo, N. Y., is now occupying its new headquarters at 1079-1081 Main street. The concern occupies the entire building in connection with the Garford-Buffalo Company and an excellent service department is maintained.

The Gallup Auto Company, Gallup, N. M., of which C. L. Day is proprietor, has started the actual work of construction on a new garage, which will be thoroughly equipped for all kinds of service.

The W. L. Huffman Automobile Company, Omaha, Neb., has purchased the stock and lease of the J. J. Deright Automobile Company at 1816-1818 Farnham street, including the Stoddard-Dayton and Locomobile cars. The building will be completely remodeled to care for the increased business.

Floyd P. Harris and Raleigh L. Harris have made arrangements to open a garage at Galva, Ill., where a building is being remodeled.

C. F. Edick is to manage a new garage at Hubbard, Ia., and plans have been made for the construction of a new brick building.

Edward P. Young, agent at Syracuse, N. Y., for the Maxwell and Regal cars, has occupied a garage building recently completed on Jackson street, and in which are complete salesrooms and a service station.

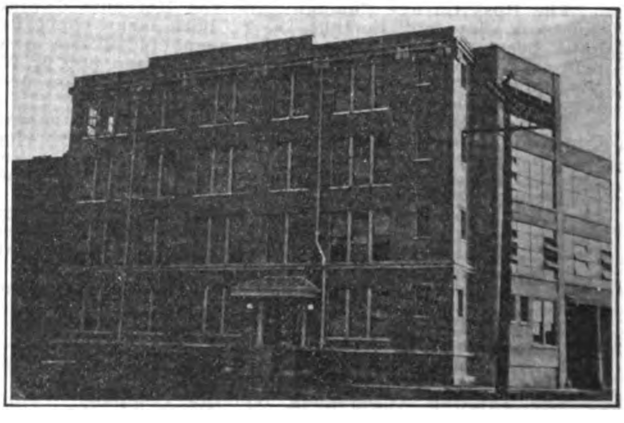
H. L. Cook & Co., Palestine, Tex., has begun work on the erection of a new brick garage.

The Woodburn Auto Company, Woodburn, Ind., is erecting a large addition to its plant.

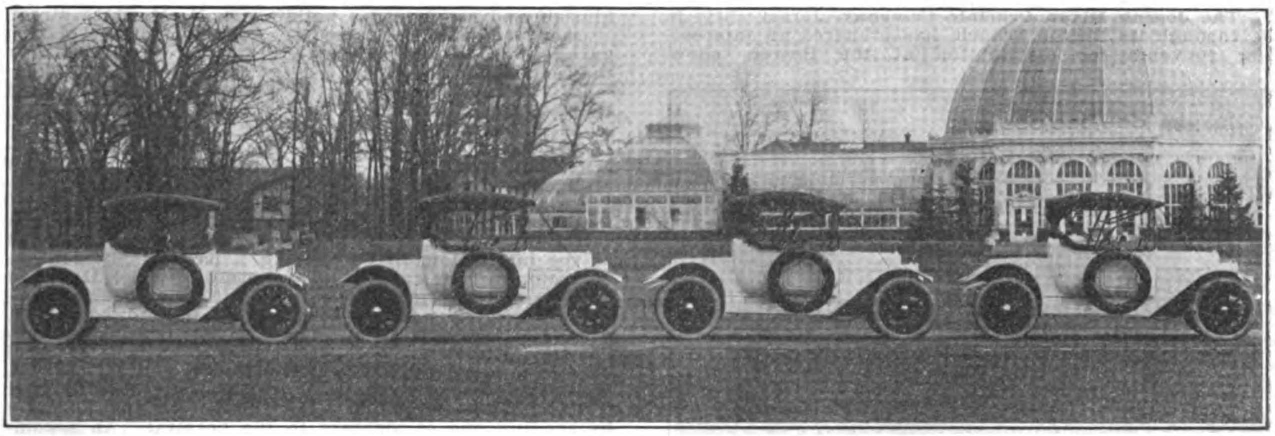
Fred Jensen and Milton Frey of Hancock, Minn., have formed a partnership and will erect a modern garage in that place. They will conduct a general automobile business and will be equipped to do repair work of all kinds.

E. H. Broadwell, vice president of the Hudson Motor Car Company, Detroit, maker of Hudson cars, is reported at New York City as saying he has withdrawn from the company, having sold all his holdings. Mr. Broadwell will leave for Florida, where he will remain for some time. He announced no plans for the immediate future.

The Glenwood Garage Company, which operated the Glenwood garage at Riverside, Cal., under the management of C. A. Dundas, has awarded the contract for a substantial addition to the plant.



New Office Building of the Miami Cycle & Manufacturing Company, Middletown, O.



Fleet of Abbott-Detroit Cars Recently Delivered to the City of Denver, Col., for Use of Assistant Fire Chiefs.

The Central Vulcanizing Company, Albany, N. Y., has purchased a two-story building at 148 Central avenue and after suitable alterations have been made, will move from 357 Central avenue. Jacob Brown is manager of the concern.

O. M. Driscoll has opened a large salesroom and service station at 24 East Front street, Trenton, N. J. He handles the Hupmobile line, made by the Hupp Motor Car Company, Detroit.

The West Virginia Automobile Company, Wheeling, W. Va., has sold its garage on 16th street to a new company, the name of which was not announced. Extensive improvements are to be made it is said.

The Central Iowa Motors Company, Des Moines, Ia., has purchased the interest of the Van Vliet-Bradt Auto Company at 706 Mulberry street, and will make improvements to the garage building.

The Fleming Auto & Tire Company, Montgomery, Ala., has been formed and has leased the garage at 21 Washington street. The company will distribute the Overland line, made by the Willys-Overland Company, Toledo, O.

Perl W. Devendorf, Watertown, N. Y., has purchased the entire interest of the Warner Automobile Company at 155 Arsenal street. Mr. Devendorf will handle the Ford cars.

The Waupaca Garage, owned by F. L. Hoaglin, Waupaca, Wis., has been transferred to Van A. Nelson, who will also take the agencies for three well known makes of cars.

The White Motors Company, New Haven, Conn., is erecting a new service station at 1094 Chapel street, to cost $2000.

The Boonton Auto Garage & Transportation Company, Boonton, N. J., will erect another garage adjoining its present establishment on Washington street.

R. J. Moore, Glasgow, Mont., has sold his interest in the Moore garage on Market street to J. H. Aschliman, formerly of Twin Cities, Mont.

The Abbott Motor Company, Detroit, Mich., recently filled an order for four Abbott-Detroit roadsters, finished in white with gold stripes and red artillery wheels, for the city of Denver, Col. These cars, which are shown in an accompanying illustration, are for the use of the assistant chiefs of the fire department.

W. H. Olds of Crookston, Minn., who conducts a garage and repair shop for automobiles, motorcycles and bicycles, is enlarging his place of business.

Charles E. Preston, Berwick, N. H., has fitted up his garage in the Clark & Davis building at Sullivan square and the business will be conducted under the name of the Preston Auto Garage Company. Mr. Preston will handle the Ford cars, which are made by the Ford Motor Company, Detroit.

Miller & Geiger, Birdsboro, Penn., has completed improvements to a building on Main street, which has been transformed into a modern garage and repair shop.

Yerkes & Pritchard, Paris, Ky., is the name of a new firm which has opened a garage and repair shop in that town.

The Sims-Thomson Garage, Waxahachie, Tex., is to be enlarged to care for growing business.

Thomas Kielty and H. Ryan, DeGraff, Minn., will erect a garage in that town which will be modern and contain an up-to-date repair shop.

Ralph Peltier and Arthur R. Weld have opened an automobile repair shop on Federal street, Greenfield, Mass. They are prepared to undertake work of all kinds.

The National Motor Vehicle Company, Indianapolis, Ind., maker of National cars, has completed another addition to its already large plant in the Indiana metropolis. The latest addition, required by the steady increase in business, is a modern brick and cement building that allows general expansion and at the same time increases efficiency and eliminates any possible lost motion in getting materials from one department to another. The new building, shown in an accompanying illustration, allows 20,000 feet of floor space and there are three floors. The first floor will be a general expansion of the machine shops, the second an enlargement of the paint department and the third an increase of the trimming and upholstery departments.

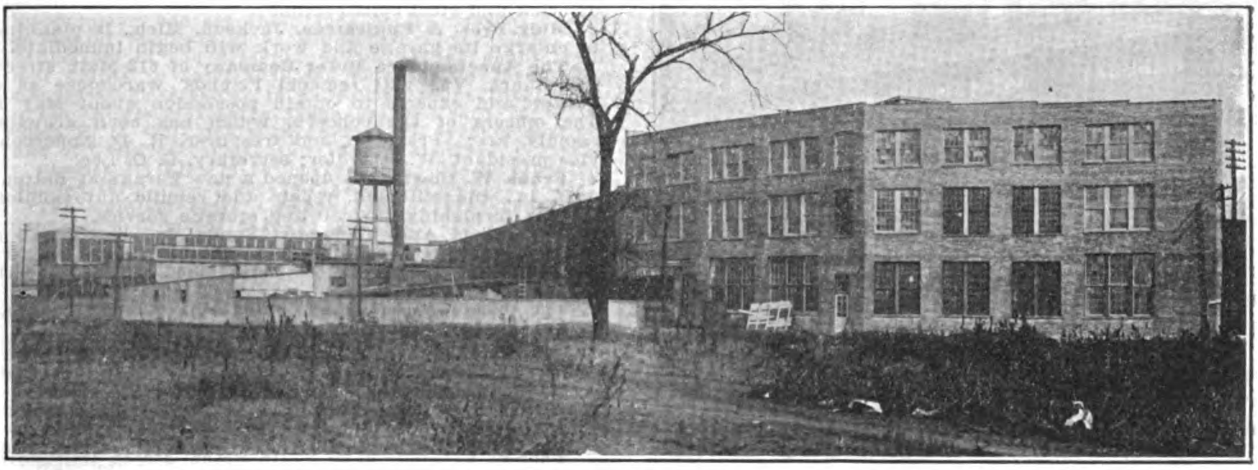
Sanders Nestegard and A. C. Halmsness, Fillmore, N. D., have erected a modern garage in that town.

Abel Mitchell, Madison, S. D., is making repairs to the Tierney building on West Fourth street, to accommodate his garage and automobile business.

Charles C. Collins and Thomas S. Davidson of Denver, Col., have formed a company to handle automobile tire supplies. The concern is located at 1633 Court Place.

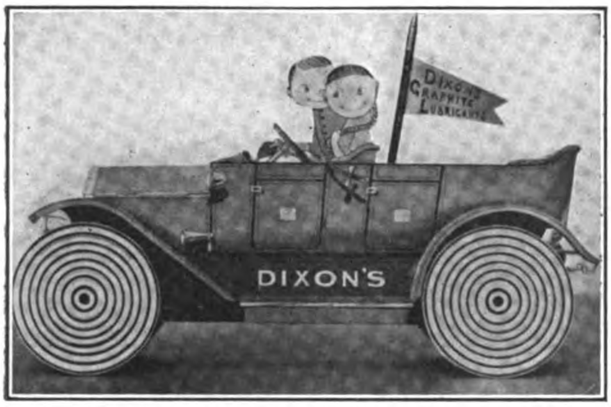
The Landman-Griffith Motor Company, 1010 Madison avenue, Toledo, O., has moved into its new building at 14th street and Madison street. The company features Flanders electric cars.

The Southern Motors Company, Louisville, Ky., has plans for a new garage and service station to be erected at 615 South Third street at a cost of $50,000. The company handles the Packard, Hudson and Detroit electric.



Two-Story Addition Recently Completed for the National Motor Vehicle Company, Maker of National Cars at Indianapolis, Ind.

The Joseph Dixon Crucible Company, Jersey City, N. J., through its Boston branch, has prepared an interesting souvenir for distribution at the Boston show. It is termed a moving picture and is presented in an accompanying illustration. It is expected to prove a unique method of calling attention to the graphite lubricating products made by this concern.



Joseph Dixon Crucible Company's Show Souvenir—Move in a Small Circle and Watch the Wheels Go Around.

The Watts Wagon & Auto Company, Harrisburg, Penn., was recently formed by F. N. Watts, the veteran wagon man, who started business 28 years ago, and the firm will soon occupy a three-story building at 1017-1019 Market street, which is in course of reconstruction.

The Pacific Auto Company, Bellingham, Wash., has occupied its new garage on Washington street, and is equipped to handle all kinds of business.

Stanley Pritchard of Portsmouth, O., has caused to be erected a new garage on Gallia street to accommodate his increasing business.

H. W. Jones, who some time ago purchased the interest of his partner, Frank Vana, in the Montrose garage at Cedar Rapids, Ia., is having erected a new garage and machine shop to be occupied as soon as completed.

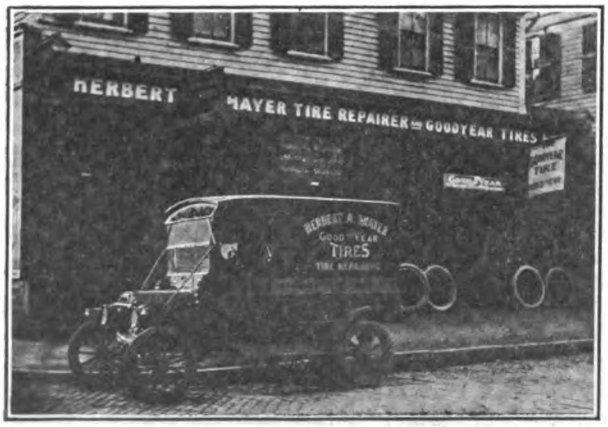
Perkins & Jenkins of Caldwell, Tex., is enlarging and remodelling its garage so as to provide accommodation for the ever increasing number of automobiles being brought to the plant.

The H. E. Ross Electric Company, Davenport, Ia., which handles the Ohio electric cars at 525-527 West Second street, has completed improvements to the garage that cost $3600 and which make it one of the finest equipped and furnished electric garages in that part of the country.

The Plow City Garage on Sixth avenue, Moline, Ill., owned and managed by Fred Young, was recently completed and it is one of the most modern in Moline, being equipped with the most up-to-date equipment.

G. C. Mars, formerly of the Craig-Centre Auto Company, Pittsburg, Penn., is erecting a two-story brick garage at 4610-4612 Center avenue at a cost of $12,000.

Herbert A. Thayer, 400-404 Weybosset street, Providence, R. I., not only is the local agent for Goodyear tires, made by the Goodyear Tire & Rubber Company, Akron, O., but maintains a general business in repairing and vulcanizing casings and tubes. That Mr. Thayer is an enterprising business man is borne out by the fact that he has inaugurated a system of calling for and delivering work, in connection with which he makes use of the Ford car shown in the accompanying illustration.



Herbert A. Thayer's Goodyear Tire Agency in Providence, R. I., and Ford Car Used in His Delivery Service.

Fred Yoho, formerly with the Oliver & Martin Garage at Martins Ferry, W. Va., has entered business for himself and has leased a building on North Sixth street.

M. J. Hubbard has leased the rear part of the Marion garage, Marion, Ia., of J. L. Ingram and has taken over the repair shop.

C. V. Deane, formerly with McCallum & Deane, Grand Rapids, Mich., has completed a new concrete garage, which he has occupied.

Bruce Borland of the Borland-Grannis Company, Chicago, maker of Borland electric cars, is proud of the part his company played recently in a difficult surgical operation at the Children's Memorial Hospital in that city. Dr. Fred Albee of New York City, a noted surgeon, was called to Chicago to assist Dr. E. W. Ryerson, the head of the institution, in performing a particularly delicate operation in bone surgery on two cases in which the front of the spine had been eaten away until the patients were humpbacked to a pitiful degree. It was found on Dr. Albee's arrival that an electric motor controlling a circular saw was required in order to cut away a strip of bone. Dr. Albee's instruments only took a direct current, while the hospital's current was of the alternating. After trying various means Mr. Borland solved the difficulty by sending one of his cars to the hospital. An accompanying illustration shows the car, from which a cord led to the third story hospital window, supplying the necessary direct current for the instruments. Dr. Ryerson has utilized the Borland cars on three similar occasions.

Bonnewits Bros. of Van Wert, O., has completed the foundations for a two-story, fireproof garage and machine shop which will measure 60 by 132 feet. The equipment of the structure will include an electric elevator, private heat and water plants, plate and prism glass, sidewalk lights, etc.

Borland Electric Aids Famous Surgeon in Performing Remarkable Operation.

The Standard Garage Company, Uniontown, Penn., is building a $50,000 garage, the foundation work having been begun. The building will be two stories high and of brick and steel construction.

Muir Bros. & Fuglesteen, Jackson, Mich., is planning to enlarge its garage and work will begin immediately.

The Apperson-Lee Motor Company of 612 Main street, Lynchburg, Va., will remodel Friends' warehouse as a garage and expects to obtain possession about May 1. The officers of the concern, which has been growing rapidly, are: President and treasurer, R. D. Apperson; vice president, W. B. Miller; secretary, G. O. Lee.

Frank W. Downs has opened a new garage at Bettendorf, Ia., and will sell, repair and rebuild automobiles, besides furnishing taxicab and storage service.

The Fonda Auto Company, Fonda, Ia., has leased a building formerly occupied as a moving picture theatre and a new garage will be established, to be modern throughout.

The Oregon Vulcanizing Company, Portland, Ore., has moved into new quarters on Washington street.

PROPOSED NEW GARAGES.

Thomas E. Goode of 23 South Bethel street, Baltimore, Md., has awarded the contract for an extension to a garage on Lombard street. The front portion will be two stories high, while the rear will be one story.

The Ideal Garage Company, Frederick, Md., will build an addition to its plant, for which a contract was recently awarded.

The Ford Motor Company, Detroit, maker of Ford cars, is receiving estimates for a five-story and basement assembling plant and salesroom at Forest Park boulevard and Sarah street, St. Louis, Mo. The estimated cost is $200,000 and the most modern machinery will be installed.

The Tyson & Jones Buggy Company, Aberdeen, N. C., has plans for the erection of a new garage.

N. W. Fox of Statesville, N. C., is planning to build a three-story brick garage.

The Thomasville Auto Works, Thomasvile, N. C., has awarded a contract for a garage and repair shop, which will be equipped with the latest pattern of machinery.

H. L. Cook of Palestine, Tex., is interested in the erection of a new garage on Spring street, that city.

The Whittlesey Garage & Machine Company, San Benito, Tex., has opened bids for a new two-story garage to cost $1800. The machinery, which has been purchased, cost $8000.

The Craig Transfer & Motor Car Company, New Castle, Va., recently incorporated, is erecting a new concrete garage building.

The Peters Wagon & Auto Works, Baltimore, Md., has plans to erect a 100 by 40 foot addition to its building, to be used for the purpose of building commercial motor vehicles.

James B. Haggin of Lexington, Ky., has announced that he will build a modern garage to cost $7500.

W. J. Hefner of El Campo, Tex., is erecting a brick building to be occupied as a garage and repair shop by Woolston Bros. of that place.

The Tyson & Jones Buggy Company, Carthage, N. C., which is building a garage at Aberdeen, N. C., is erecting a building at Carthage to be used as an automobile repair shop.

J. Wheeler McGee, trustee for the Armstrong estate, Louisville, Ky., has awarded the contract to the Alfred Struck Company of Louisville to erect a fireproof garage to cost $45,000.

Guests of the Goodyear Tire & Rubber Company at the $40,000,000 Dinner at Rector's During Show Week.

The Halsey Automobile Company, St. Louis, Mo., will soon erect a five or six-story garage to cost $25,000.

The Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, recently held a banquet at the Hotel Astor, New York City, which was attended by 200 dealers as guests of the company. It was officially termed the $40,000,000 dinner, because of the fact that the company has set that mark to be reached by the amount of business to be transacted during 1913. The enthusiasm of the dealers present left no doubt as to their ability to accomplish the task set for them. The banquet scene is shown in an accompanying illustration.

The Newbern Garage Company, Newbern, N. C., of which E. H. Williams is president, will erect a new garage of fireproof construction to cost $10,000.

Charles W. Ellis of Greenville, S. C., has awarded the contract for a steel frame garage to cost $4000.

The Cadillac Sales Company, Knoxville, Tenn., has plans for a fireproof garage, salesroom and repair shop at Gay street and Main avenue.

C. M. Marshall & Co., Lexington, Ky., will erect a service station at 177 North Upper street to be two stories high and of pressed brick construction. A fully equipped machine and repair shop will be installed.

The Crispen Motor Company, Harrisburg, Penn., will build a $20,000 garage on Cameron street. It will be two stories high and built of steel and tile.

The Stoddard Motor Car Company, Springfield, Mass., has purchased land on Winter street, at the rear of its present garage, and a substantial addition to the plant will be built.

Rundlett & Reynolds, New Rochelle, N. Y., is about to add a third story to its garage building, to be used as a paint shop and for dead storage. This will enable the firm to utilize space on the lower floors for an enlargement of its garage and repair shops. The alterations will cost about $7000.

The Ford Motor Company, Riverside, Cal., will build a new garage on Eighth street, to cost $8000. Glenn A. Calkins, manager of the company, expects to have one of the best automobile show places in that part of California.

The Beckley-Ralston Company, Chicago, dealer in automobile and motorcycle supplies, has leased a six-story building, which is to be erected at Michigan avenue and 18th street. The company will occupy the entire building and the annual rental will be about $22,500.

The City Auto & Machine Company, Latrobe, Penn., will build a big garage on Depot street, which will be modern in every particular.

H. C. Crofoot of Homer, N. Y., is to erect a new garage to be known as the Brighton, on South Salina street, Syracuse, N. Y., at a cost of $6000.

The Cadillac Automobile Agency, Wichita, Kan., is having erected a fine new garage at Lawrence avenue and English street, which it has leased for 10 years of E. E. Morris, owner of the property.

G. O. Robinson, a prominent business man of Bellaire, W. Va., has plans for a new garage to be erected on Belmont street at a cost of $15,000. When completed it will be one of the finest garages in the Ohio valley.

NEW AGENCIES.

The Owen McFarland Auto Company, San Francisco, Cal., has taken the agency for the commercial cars built by the International Harvester Company of America, Chicago.

The United Motor Charlotte Company, Columbia, S. C., of which J. H. Ham is manager, has given up the Maxwell car and has taken the agency for the two Carolinas for the Regal and Marion cars.

H. A. Testard of New Orleans, La., has opened an agency in that city for Alco trucks and pleasure cars, made by the American Locomotive Company, New York City.

F. W. Lintz, president and general manager of the United States Motors San Francisco Company, San Francisco, has closed a contract whereby his concern will distribute the Maxwell line in the Northern California territory.

C. C. Tanner, formerly of the Northwest Auto Company, St. Joseph, Mo., and W. J. Caughey, until recently in charge of the Ford distributing agency at Atchison, Kan., have taken the Marathon car distributing agency in Kansas City, Mo. Mr. Tanner will remain at St. Joseph and look after Marathon interests there, while Mr. Caughey will have charge of the Kansas City branch.

Ehrsman & Rich, Gridley, Ill.; J. A. Murray, Holder, Ill.; C. G. Preble, Lexington, Ill., and Brumme & Fitzgerald of Cooksville, Ill., have taken agencies for the Ford cars. E. C. Bump of Farmington, Me., has also taken a Ford agency in his territory.

The Archey-Atkins Company, Indianapolis, Ind., has been given the agency for Mais trucks, made by the Mais Motor Truck Company, Indianapolis, for the State of Indiana.

W. R. Shaw of Syracuse, N. Y., has taken over the local agency for Alco trucks and pleasure cars.

The Motor Parts Company, 185-187 Columbus avenue, Boston, has been appointed distributor for the products of the Bosch Magneto Company, New York City, maker of Bosch magnetos. A complete stock of magnetos, spare parts, spark plugs and other Bosch products will be carried in stock. F. W. Wilkening will be in charge of the Boston store, which is a branch of the Motor Parts Company of Philadelphia, Penn.

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Devoted Exclusively to the Automobile Trade and Allied Interests

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GARAGE INCOMES.

Proprietors of garages are divided in their opinion concerning the expediency of the action taken recently by a large garage owner in New York City, in raising the storage rate $5 a month and reducing the price of gasoline to a flat rate. His price for fuel is five cents less than that charged in other garages, but his income is balanced by the additional revenue received from storage.

The contention that a garage proprietor is acting unwisely when he relies for his profit upon the sale of an outside product like gasoline, over which he has no control, is not without merit. Because of the storage rates charged, many have been forced to take their profit from the sale of fuel. The New York man claims merely to have transferred his business from an outside to his own control, thereby placing his investment on a stable basis, and not risking failure through the operations of interests dominating a fluctuating product, which is properly a side line to the garage business.

It is maintained by many that the garagemen have erred in making fuel a main source of income and that they should adopt the principle of taking their profit from the business in which they have invested their capital, considering the sale of fuel as an accommodation to customers. Motorists can be depended upon to realize the garageman's position and to co-operate with him for their mutual benefit. Whatever opinion one holds with regard to the matter, it is a subject that will bear much careful consideration.

BENEFITS OF SYSTEM.

The Accessory and Garage Journal has from time to time elaborated upon the advantages of system and presented in more or less concise form numerous systems of proved worth as adapted to various branches of the garage business. System is the balance wheel between success and failure, inasmuch as proper accounting enables the proprietor to keep track of all transactions, compute the cost as against the income and so amend his business as to prevent the leaks discovered by means of an adequate method of recording each business detail.

No garage can afford to be without a system. It need not be complicated, but it should be sufficient to enable the keeping of records so that the owner may place his finger upon the waste which is eating into his profits. Without this safeguard he may realize that his income should be larger, but he cannot locate the trouble. A systematic way of keeping track of labor, materials used and their cost will insure satisfactory returns from the business.

CLEAN SALESMANSHIP.

Much stress is being laid by manufacturers and dealers alike on methods of clean salesmanship and the agitation promises to result in great benefit to the industry as a whole. Some sharp practises have been restorted to in the past by salesmen whose main object has been to effect a sale, but happily these have been rapidly weeded out. Disparaging a competitor's product is no longer popular and this is a sign of healthy progress. Fortunately, instances of this nature are now so uncommon as to attract decided comment when they are brought to light.

The prime requisite for a salesman's success is a complete knowledge of the line represented. When all dealers, as well as the manufacturers, insist upon this qualification and that the competitor's business be allowed to take care of itself, approved sales methods will be an assured fact and business success will be doubly certain. Too much criticism tends to destroy the prospective purchaser's confidence in all lines.

Mechanical Pointers for Garagemen and Repairmen

FILING STEPPED KEYS.

In filing stepped keys for an accurate fit, sometimes it is difficult to obtain correct alignment. At Fig. 1 B is presented a jig for this work and the loose top may be adjusted to guide a file as required.

PISTON RING DEVICE.

Removing and fitting piston rings requires care upon the part of the workmen as the members are fragile and broken easily. Various devices are made for this work and these range from strips of metal to forms of clamps. A piston ring manipulator has been brought out by an English concern, and it is claimed for the device that rings may be removed and fitted easily without liability of damage, and that the work is much simplified. The instrument is manipulated by turning a wing headed screw, illustrated at Fig. 1 A, and expansion is brought about by a similar operation, the screw drawing up a grooved circular disc which in turn bears upon the inner sides of the sloping toggles. The latter are in duplicate and secured, as shown, to the outer plates, so keeping these vertical and parallel.

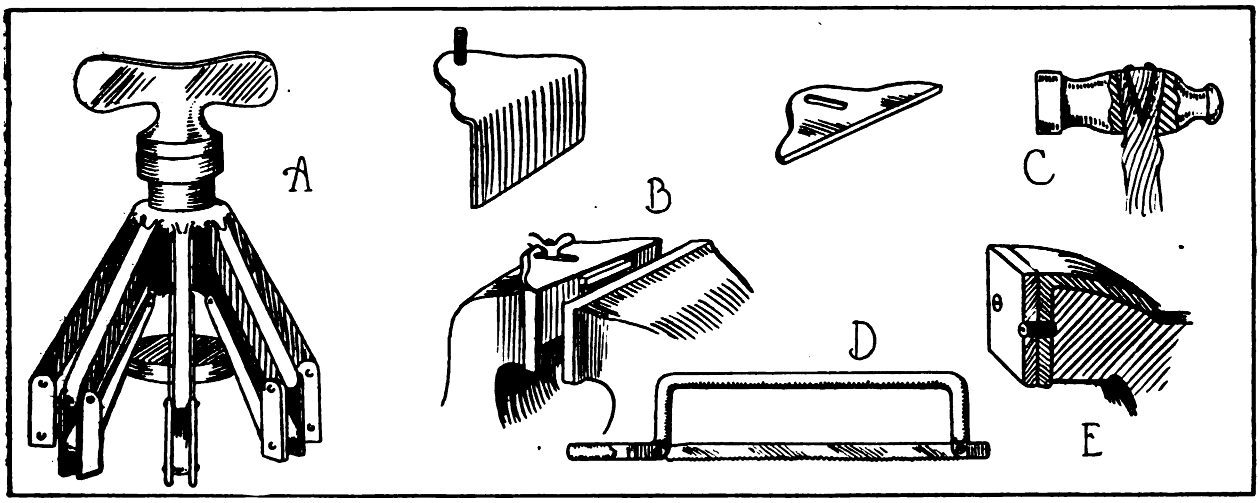


Fig. 1—Some Repair Shop Hints: A, Piston Ring Manipulator; B, Jig for Filing Stepped Keys; C, Wedge for Fitting Handle to Hammer; D, Hacksaw Frame Made of Tubing to Take Short Blades; E, Substantial Vise Clamp.

UTILIZING OLD HACKSAW BLADES.

In the average repair shop broken hacksaw blades are consigned to the scrap heap although the members may be new and may have snapped near the end, frequently at the first cut or two of the tool. While saw frames are adjustable they usually will not take the broken members, and there also is no provision for clamping the blade.

At D is shown an easily made device for utilizing the broken blades. It consists of a frame made of .75-inch brass or copper tube which is bent into shape as shown. The under corners are flattened to hold the blade, and all sharp edges are smoothed up. Two small set screws are placed in convenient positions to hold the blades.

SECURING HAMMER HEADS.

Broken hammer handles are not uncommon, and in fitting a new shaft the following method is employed by a repairman: Turn the end to be inserted to a driving fit, saw a fairly long V slot in it lengthways, and make a wedge that will fit snugly. Next bend a piece of .03125-inch sheet iron to fit over the wedge, and punch a few holes in it with a centre punch, making the outside edges rough as shown at C. Place the sheet iron in the slot, insert wedge and drive both in firmly. It is a good plan to soak the wooden handle in water a few hours before attaching the hammer.

SOLDERING ALUMINUM.

Small surfaces of aluminum may be soldered by the use of zinc and venetian turpentine. Place the solder upon the metal together with the turpentine and heat very gently with a blowpipe until the solder is entirely melted. Large surfaces cannot be soldered easily because the solder will not flow gently.

Another method is to clean the aluminum surfaces by scraping, and cover with a layer of paraffine wax as a flux. Then coat the surfaces by fusion, with a layer of an alloy of zinc, tin and lead, preferably in the following proportions: Zinc five parts, tin two parts, lead one part. The metallic surfaces thus prepared may be soldered together either by means of zinc or cadmium, or alloys of aluminum with these metals. Any good soldering preparation will answer the purpose.

A good solder for low grade work is the following: Tin 95 parts, bismuth five parts. A good flux in all cases is either stearin, vaseline, paraffine, copaiva balsam, or benzine. In the operation of soldering, small tools of aluminum should be used, which facilitate at the same time the fusion of the solder and its adhesion to the previously prepared surfaces. Tools made of copper or brass should be avoided as they form colored alloys with the aluminum and the solder.

NEW TYPE OF MUFFLER.

With the agitation against the use of the cut-out it is interesting to note that manufacturers of mufflers are devoting considerable time to the perfection of this device, striving to reduce back pressure to a minimum as well as to eliminate noise. These members are usually constructed circular in shape but a deviation from this form is noted in the Sharpe muffler which is depicted at Fig. 2 A. It comprises three flanged and ribbed globes bolted together and mounted upon a central partitioned tube. These flanges are directly exposed to the currents of air flowing beneath the car and it is obvious that the muffler is kept at a low temperature, thus aiding the condensation and consequent loss of pressure of the exhaust.

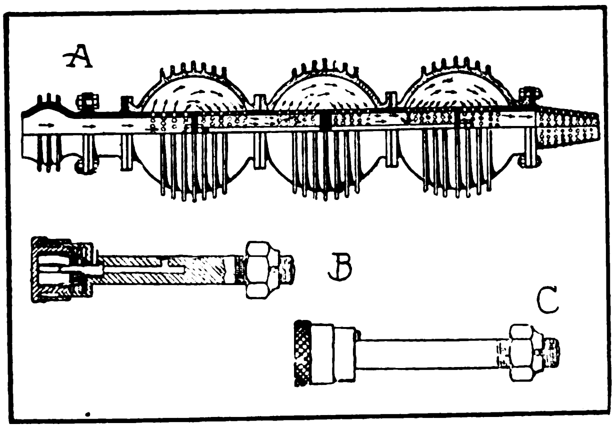


Fig. 2—A, New Type of Muffler Constructed in Two Sections, Which Is Claimed to Obviate Back Pressure; B, Sectional View of New Combined Shackle Bolt and Lubricator; C, Exterior View of Device.

In the drawing the upper half of the muffler is shown in section and it will be noted that the gas in entering is immediately broken up into several streams by passing through the first series of holes in the inlet member. A sudden expansion of gas then takes place in the first globe, where a certain amount of heat is radiated, after which the gases pass on through other apertures into the second globe and succeeding members, and into the open air through the perforated outlet tube. It is claimed of the muffler that smoky exhausts are reduced and that the silencer may be disconnected, cleaned and reassembled easily and in a very short time.

SHACKLE BOLT AND LUBRICATOR.

A combined shackle bolt and lubricator has been brought out by a French parts maker named Faudi, and the device presents many practical features inasmuch as it eliminates the screwing of a lubricator with a small threaded neck into the bolt which is sometimes broken easily. At Fig. 2 B is presented a sectional view of the device and it will be noted that one end of the bolt is made to form the body of the lubricator and has a thread formed within it. The lubricator cap has a coinciding thread cut upon its exterior to permit of its being screwed into the body. The cap's outer edge is spun over a plain sleeve which makes a dust tight fit around the body as the cap is screwed home in practise. The bolt is drilled centrally to take the lubricant and is also grooved to allow the grease to spread over the wearing surfaces. At C is shown the bolt with cap in position.

A PATTERN MAKING HINT.

A repairman of considerable experience suggests the following method of making a pattern when a patch of peculiar shape is required to fit in an awkardly situated position and he states it will obviate the necessity of making templates: Take a piece of gutta percha, large enough to make up the required pattern. The material is placed in very hot water and allowed to remain until it becomes soft and pliable. When in this condition it is pressed hard on the place which is to be fitted with a patch, and allowed to remain until it has cooled down sufficiently to become quite hard, which will take but a short time.

After the impression has been taken, the outside of the gutta percha is trimmed to the required shape and form, and any little tape intended to allow the withdrawal of the pattern from the sand should be put on. The pattern can then be sent to the foundry, and the casting will fit into place quite snugly, with the least possible amount of filing and chipping.

CARE OF GRINDING MACHINES.

The durability of a grinding machine depends largely upon the care of the operator, and will soon become unreliable if not looked after, no matter how well it may have been constructed. All wearing surfaces should be guarded carefully and kept well supplied with oil. The use of a good quality of machine oil is recommended in preference to cheap grades. Oil holes which are closed with screws usually have the words "oil hole" stamped around them, and care should be used when inserting lubricant to prevent dirt and emery grit from entering the oil.

Grinding machines should be kept as clean as possible and care should be taken that the bearings do not gum up. When opened or exposed for any purpose whatever, they should be wiped carefully before being closed again to eliminate any grit that may have lodged upon the surfaces. The spindle boxes should be clean when assembled and before tightening the caps the oil space should be filled with a good lubricant, not lard oil, and the wheel turned slowly while first one cap and then the other is screwed down until quite tight. The felt that supplies the oil to the spindle also should be kept clean.

Water should always be used on such classes of work as are affected by a change of temperature caused by grinding. It also should be used upon work revolving upon centres, as in this instance a slight change in temperature will cause the wheel to cut on one side of the piece after it has been ground apparently round. In very accurate grinding, water is especially useful, for the exactness of the work will be affected by a change in temperature which is not perceptible to the touch. It is well to use the water over and over again, as there is less difference between the temperature of the fluid and the work than if fresh water be used. Work that will grind smooth with water will often develop minute vibrations when ground dry. There is, apparently, a rapid fluctuation of temperature, which causes the work to approach and recede from the wheel very rapidly, thus leaving a rough or mottled surface.

Emery wheels always should be kept true. This can be done easily by using a diamond tool, known as the black diamond or carbon point, held in the hand or in the fixture furnished with the machine. A new emery wheel should be started slowly and trued gradually. In mounting this, elastic washers always should be placed between the wheel and the flanges. Sheet rubber is recommended for this purpose, but soft leather will answer. In some cases manufacturers attach thick, soft paper washers to each side of the wheel. When this is done it is all that is necessary. A satisfactory emery wheel is an important factor in the production of good work. Too much, however, must not be expected of one wheel. A variety of shapes, sizes and grades is necessary for the grinding machine, the same as are necessary to obtain the best results from the lathe or milling machine.

LOCATING CYLINDER CRACKS.

Sometimes a flaw in a cylinder casting will allow a slight amount of water to percolate into the combustion chamber, and when the cracks are not perceptible to the naked eye they may be located by using pressure. The water outlets should be stopped up with one exception, which is coupled to a pipe from the steam vulcanizer and the steam turned on at about 20 pounds or so, when the leak will be detected readily. This may be reached by cutting away the water jacket, and the latter repaired by welding.

GLASS CEMENT.

To cement glass, melt some resin and stir in calcined plaster until reduced to a paste, to which add boiled oil of a sufficient quantity to bring it to the consistency of honey. Apply warm. An alternate method is to mix in the following proportions: Melted resin 180 parts, burnt umber 30 parts, calcined plaster 15 parts, and boiled oil eight parts

INSTALLING STORAGE BATTERIES.

One of the chief causes of injury to storage batteries is the jolting they receive when the car is passing over rough roads. The cases containing the cells frequently become strained or chafed, allowing some of the solution to leak out, or the active material in the plates becomes dislodged. These troubles may be overcome when fitting battery boxes to the machine by making the container larger than the battery and forcing between the latter and the walls of the box smaller air tight rubber balls, such as children play with. These will hold the battery in place firmly and absorb all shocks.

DUAL IGNITION WITH ORDINARY PLUGS.

The advantages of a dual spark in the cylinder of an internal combustion motor have been pointed out from time to time in these columns but the installation of such a system usually necessitates the use of a double pole plug. A method of utilizing single pole or ordinary plugs is outlined at Fig. 3, but the hint can only be employed where dry cells or a storage battery are used and where the coil is equipped with two secondary leads; that is, each unit must have two terminals for the high-tension cables. Usually one of these is employed for grounding or for conveying the ground circuit of the coil to the frame of the car or engine as, for instance, with marine motors.

Where such a coil is in service the ground connection wire is removed from the second terminal and an additional high-tension cable attached, this lead being carried to the second spark plug, screwed to any convenient point in the cylinder head but preferably as shown in the drawing in order to obtain the highest efficiency. It should be borne in mind in locating the extra plug that the further apart the two points of ignition are the better. The diagram depicts a method for wiring the low-tension circuit as well, but this need not necessarily be followed and the existing low-tension circuit need not be changed.

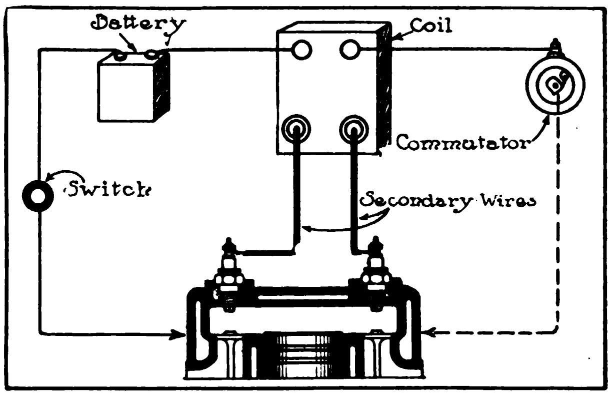
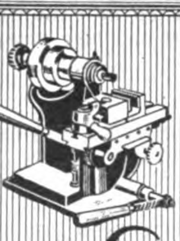


Fig. 3—Depicting Multi-Point Ignition with Single Pole Plugs.

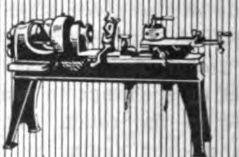
The second terminal, which is taken advantage of for multi-point ignition, is simply the other end of the secondary winding to that connected with the usual high-tension wire, and in coils where it is not exposed in this way the low-tension circuit is made use of to carry the high-tension ground circuit, usually by the way of the timer.

HANDY PISTON CLAMP.

In overhauling the piston of the motor it is sometimes necessary to place the member in the vise to perform certain work. The usual method is to grip the piston between two grooved pieces of wood. While this will hold the parts securely, it leaves but a small portion of the piston accessible without changing its position. A handy clip for holding the piston may be made from a piece of flat .75-inch spring steel about .125-inch thick. This is bent in circular form and two ends left for gripping in the vise.



Up-To-Date Shop & Garage Equipment



TOOLS FOR THE SHOP.

As business increases the proprietor of the small repair shop will add to his equipment from time to time, purchasing small tools as the work requires. There are a number of small tools which are indispensable, such as drills, reamers, taps, etc., and these may be bought singly or in sets, according to the convenience of the owner.

A scriber is a very useful instrument and is made in two forms, one a single point member for ordinary use and the other a double point. The tool depicted at Fig. 1 A, has points made of tool steel, finely tempered, threaded to screw into the holder which is knurled for a finger grip. The holder has long bearings to support the points firmly when in place and is of a suitable size to be held conveniently.

Reamers are made in several forms for different work, and are useful for enlarging holes. At B is shown a type of solid hand reamer while that at F is for roughing and finishing. In fitting taper pins the tool illustrated at E will be required. As the machine equipment of the shop is increased other tools of this nature will be added such as rose, expansion, chucking, shell, etc.

Drills.

With the drill equipment should be included a countersink, and a tool combining a centre drill and countersink is shown at Fig. 2 C. When very true work is required it is preferable to so shape the countersink that the lathe centre will first bear at the smallest part of the cone. This will cause the countersink to wear and keep true with the hole. If the centre drilling is to be done by hand it is important to relax every few seconds the hold upon the work to permit it to make about one-third of a revolution, which may be done while the other hand is supplying oil to the drill. The object and effect of this is to cause the centre drilling to be true, which otherwise it would not be, especially if the work be comparatively heavy, or one side heavier than on another.

Twist drills when utilized with power, come in sets, and with each is a steel socket which fits the drill press spindle at one end, and at the other the recess takes all drills in the set. One of the holders is outlined at Fig. 1 C, and to enable the drill to be extracted easily from the socket, the latter is provided with a slot, which passes entirely through it. The drill end protrudes into this slot, so that if a key or wedge be driven into the opening, the drill will be forced out. Conventional types of drills are shown at Fig. 3, A and B, the former being adapted to the drill holder mentioned above.

Taps.

Machinists' hand taps are made in three different styles, taper, plug and bottoming, and these are depicted at Fig. 3, D, E and F. Tools for use in holes to be tapped deeply should be of slightly larger diameter than those employed for shallow ones, because in deep holes the tap is held steady by its depth in the hole, and whatever variations there may be between the pitch of the threads in the hole and those on the bolt, is experienced to a greater extent as the length of the thread increases. A short hob or master tap is outlined at Fig. 1 D.

CURTIS AIR COMPRESSOR.

The progressive garage or repair shop does not rely upon the manually operated tire pump, the utilization of which means a considerable loss of time. Then again, the member becomes misplaced when most needed. By having a tank of compressed air the garage is in a position to render efficient service to its customers and it really is economy as the attendant is not called upon to hunt for the ordinary member.

With a compressor it is an easy matter to keep the storage tank filled with air, ready for service. The Curtis & Co. Manufacturing Company, St. Louis, Mo., is producing an air-cooled compressor in two sizes, adapted for the public service station and private gar-

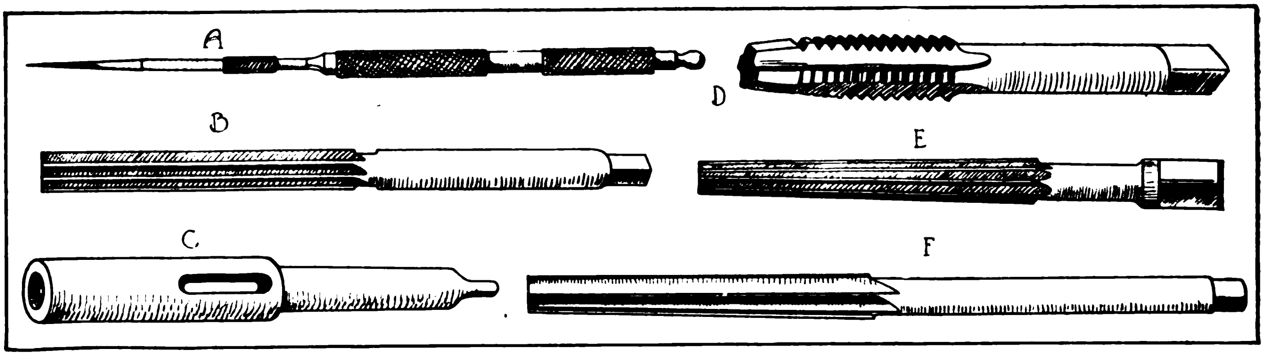


Fig. 1—Depicting Tools for the Shop Equipment: A, Scriber; B, E and F, Reamers; C, Drill Holder; D, Short Hob or Master Tap.

age, these having a bore and stroke of two by 2.5 and three by 3.5 inches, respectively. The device is depicted at Fig. 4, A and B, the latter view outlining its construction. Water-cooled types are also manufactured, these having a bore and stroke of three by 3.5, 3.5 by 3.5 and four by 4.5 inches, respectively. Either design lends itself readily for belting directly to line shaft or motor, according to its installation.

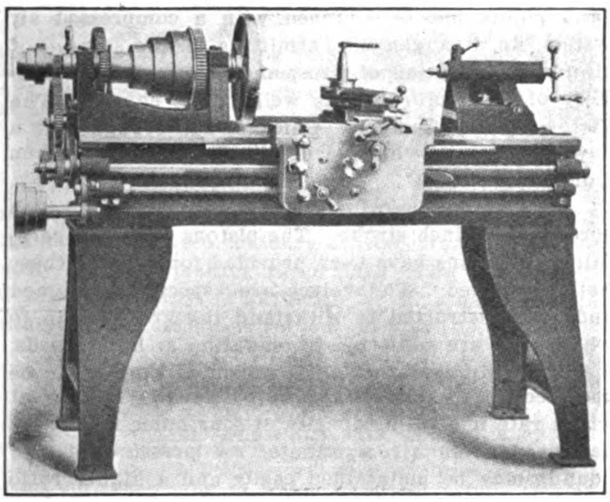


Fig. 2—Sebastian 15-Inch Lathe, Designed Especially for Automobile Work.

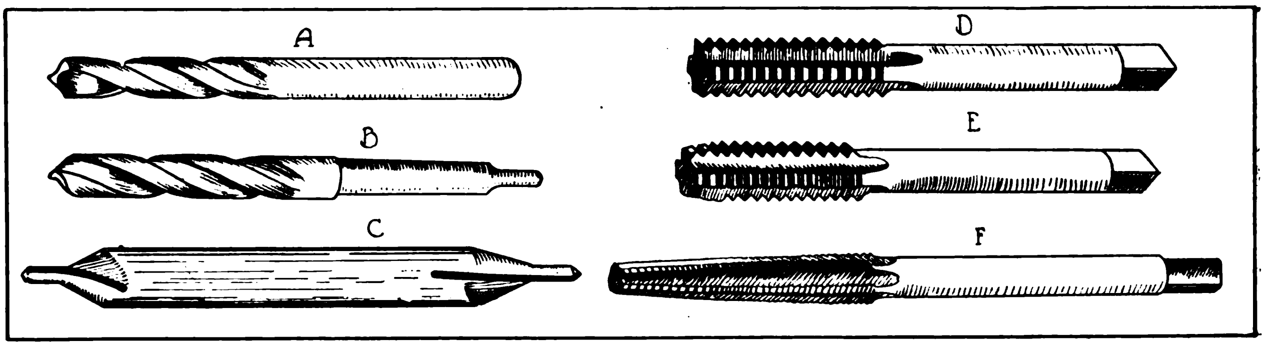


Fig. 3—Tools for the Repair Shop: A and B, Twist Drills; C, Combined Drill and Countersink; D, E and F, Taper, Plug and Machinists' Bottoming Taps.

The vertical, up-plunger type of pump is employed, the maker pointing out that this construction eliminates grease or oil being carried over into the receiver and thence to the tires. Several new features are noticeable in the new compressor, these including a springless inlet valve on the piston head; fan shaped arms on the flywheel, which direct a current of air onto the cooling fins, etc. Lubrication is by a gravity feed oil cup on the side of the cylinder, the device supplying lubricant to the piston and wristpin. The crankshaft is of ample dimensions and throughout the best of material and workmanship are employed.

SEBASTIAN LATHE.

As the increase in business warrants the expenditure the small repair shop adds a lathe to its equipment, a valuable addition as much work formerly sent elsewhere is turned out quicker and economy effected. Many times a job is held up waiting for a small piece of machine work sent outside.

The Sebastian Lathe Company, Cincinnati, O., makes a specialty of lathes and tools and produces a number of the former, one that is specially adapted for the garage being shown at Fig. 2. It is low priced, constructed of high grade material throughout, has screw, rod and power cross feeds, and cuts standard threads with furnished gears from five to 36. The head stocks are sturdily constructed and the spindles are hollow, made of a high grade steel and operate in phosphor bronze boxes.

The cone pulleys have four steps and with the back gear give eight changes of speed. The tail stocks are of the cut-under pattern, allowing the compound rest to swing parallel with the ways and over the base of the tail stock, with room to operate the feed screw handles. They have adjustable side movement for taper turning, heavy spindles and self-discharging centres. The carriages are of the most approved design, rigid and substantial, and T slots are arranged in both front and rear arms.

When it is desired to utilize the cross feeds separately, the carriages may be clamped solidly to the bed by a simple device. The cross feed screws are graduated to .001 inch. Plain or compound rests are supplied and these are interchangeable. The tool posts are cut from a solid bar, and the lead screws are cut carefully from a master screw, insuring accuracy. The countershafts have improved friction clutch pulleys with large surfaces, and ample provision is made for lubrication. The pulleys of the countershaft are nine inches in diameter with three-inch face and are designed to run at 190 revolutions a minute.

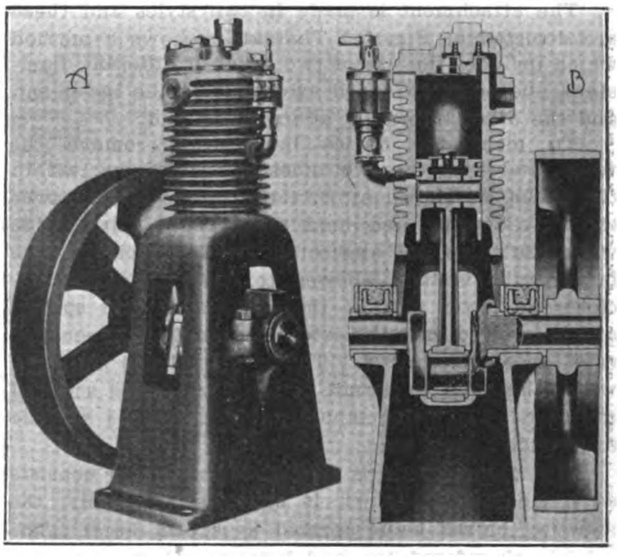


Fig. 4—Curtis Air Compressor, Made in Several Sizes, Both Air and Water-Cooled and Operated by Belt.

The dimensions of the lathe are as follows: Swings over bed, 13 inches; swings over carriage, 7.5 inches; length of bed, six feet; takes between centres, 40 inches; diameter of spindle nose, 2.125 inches; threads of spindle nose, eight inches; hole through spindle, 1.3135 inches; size of tools, .5 and one inch; ratio of back gear, 7.5 to one; diameter of tail spindle, 1.5625 inches; compound rest travels, 4.25 inches; capacity of centre rest, 3.5 inches.

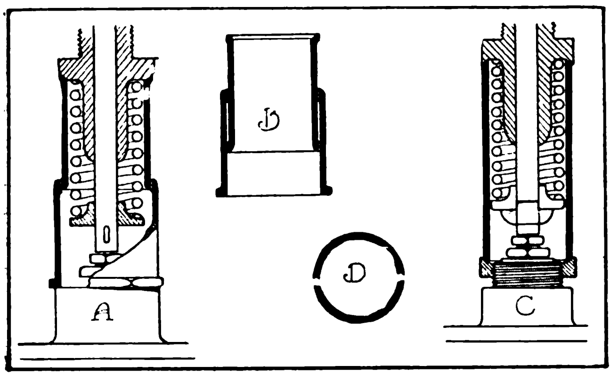


Fig. 5—Methods of Quieting Noisy Valve Action: A, Telescoping Tubes; B, Outlining Operation of Assembly; C, Employing Split Tubes; D, Showing How Tubes Are Constructed.

Hand rest and chuck plate are extra.

A set of 10 tools is provided as equipment with this lathe.

QUIETING NOISY VALVE ACTION.

With the introduction of the sleeve valve motors the manufacturers of engines utilizing the poppet valve have brought out refinements which render the action of the valve mechanism noiseless. Some makers enclose the valves, which not only deadens any existing noise, but protects the parts from wear by excluding dust attracted by the oil.

Many motors, especially those of early designs, are not constructed so that a plate may be fitted without considerable work.

For the purpose of meeting the demand for a valve quieting device, an English concern has brought out what is termed a "silent tappet sock," and its principle is similar to a device which was recently put on the market.

The attachment is made in two styles and these are depicted at Fig. 5. That at A shows a method which includes the use of two tubes of different diameters, one being threaded externally at the lower end and the other internally at its upper end.

To place the device in position remove the valve, and with the two tubes telescoped one within the other, as shown at B, they can be slipped over the valve spring and held against the valve guide while the valve, cap and cotter key are replaced. The larger tube is then allowed to drop down and enclose the lower part of the valve stem and spring, and is screwed onto the external thread of the smaller tube, as outlined at A. The lower tube is equipped with a hexagon to permit of the parts being screwed together. The valve tappet guide is altered slightly to provide a good seat.

The other design is illustrated at C and consists of a single tube which is split longitudinally, the abutting halves being formed as shown at D. The tube is chamfered top and bottom and the latter is held firmly in place by a coned nut, which is intended to be screwed onto the top of the tappet guide. This guide should have sufficient substance to allow a thread to be cut, and will have to be removed for the work.

NEW VICTOR AIR COMPRESSOR.

The up-to-date garage no longer relies upon the hand pump, but is equipped with a compressed air system, an arrangement permitting of the storage of air for the inflation of tires, and cleaning the upholstery of the motor car, as well as the chassis. The Victor Electric Company, Chicago, has brought out a new compressor which is designed to be belt driven from a line shaft

It is a double-cylinder unit, having a 2.5-inch bore and two-inch stroke. The pistons are fitted carefully and means have been provided for keeping these well lubricated. The valves are especially designed and are constructed to withstand the great strain to which they are subjected in operating at high speeds.

The compressor, which is shown at Fig. 6, can be operated safely up to 360 revolutions a minute at which rate it gives a capacity of four cubic feet or 30 gallons of free air a minute. A pressure of 125 pounds may be maintained easily and a higher ratio if desired. The pulley is located between the cylinders and it is claimed that the device operates with the least possible noise, that all parts are interchangeable, and that it is economical in operation.

A SIMPLE VISE KINK.

Frequent use of the vise results in the knobs on the handles becoming roughened and when considerable filing is done the hole fills with chips and dirt. This can be prevented by fitting a couple of rings, such as come on mineral water bottles, and placing them just under the knobs of the vise handle.

STURDY VISE CLAMP.

Vise clamps which present a square edge for holding small work and which wear considerably longer than the usual members, may be made from a piece of .1875-inch sheet iron by hammering them to shape in the tightened vise. Next rivet on the inside face of the clamps a squared piece of brass and copper, and trim off the edges with a file. See E, Fig. 1, Page 19.

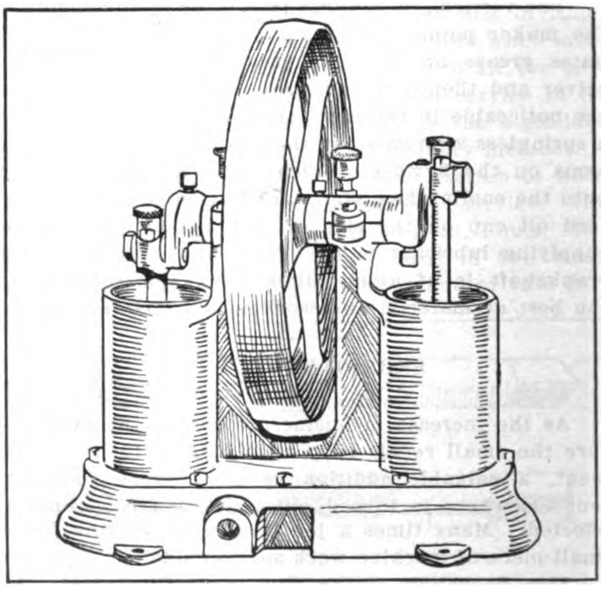


Fig. 6—New Double-Cylinder Compressor Brought Out by the Victor Electric Company.

CORRESPONDENCE WITH THE READER.

Screw Cutting Lathe.

(136)—Can you inform me of any books on the operation of the screw cutting lathe that would be of any benefit to anyone in gas engine construction and repairing? Also, where can I obtain the necessary jigs and dogs to clamp on face plates, etc., to hold engine cranks, shafts, etc., for turning? P. J. FOSTER.
Throckmorton, Tex., March 12.

The Hill Publishing Company, New York City, publishes information of this nature. Regarding the jigs and dogs, these could be secured from any of the many concerns making these tools. The Braunsdorf-Mueller Company, Elizabeth, N. J., manufactures lathe appliances.

Power Tire Pumps.

(137)—I wish to inquire regarding the probable outcome or effect of inflating a tire with a power pump that will pump in gas from a cylinder of an internal combustion engine. I have constructed a power pump out of an old spark plug to which I connect a tube leading to the shoe. In inflating I run the motor on three cylinders and find that I can inflate a tire in a very short time, and the operation does away with the drudgery of pumping. This of course pumps the tire with the gas and by compression from the cylinder. Is there any danger of the gas exploding and will the tire get hot enough to bring about an ignition of the mixture? Will the gas or compressed air injure the tube if no lubricating oil exists? J. R. SPANN.
Anderson, Cal., March 13.

According to a leading tire manufacturer the gasoline in the mixture will cause a rapid deterioration of the inner tubes. Regarding combustion, it is questionable if the car could be driven fast enough to produce friction that would ignite the mixture in the inner tube. If oil finds its way past the rings of the piston and thence into the inner tube it probably would injure the rubber in time.

Mixing Acetylene with Air.

(138)—What is the minimum and maximum amount of acetylene that can be mixed with air which will ignite readily from a spark? About what pressure can a mixture of nine parts air to one part acetylene be compressed without danger of being exploded? Can a mixture of the above proportions be drawn into a pump and forced through a small brass tube without danger of being exploded from the pressure or friction produced? If a mixture of the above proportions were injected into a cylinder just after the motor stopped, would there be any probability of the gas being exploded when the same came in contact with the hot inner walls of the cylinder? G. B. H.
Merkel, Tex., Feb. 28.

According to O. H. Skinner, general superintendent of the Prest-O-Lite Company, Indianapolis, the proportions for perfect combustion are approximately nine parts air and one acetylene. Such a mixture burns with an explosive wave when ignited. It should not be compressed except under those conditions existing in the cylinders of an internal combustion engine running in the usual manner. If such mixtures of gas were compressed in the compressor so that absolutely all heat of compression were removed it might possibly be done with safety. However, it must be borne in mind that the violence of the explosion increases as the pressure increases, and should such a mixture become ignited there might be danger. Such mixtures taken into the engine in the usual manner through the manifold are not subjected to compression so great that there is any danger of injury to any part of the machinery when the gas is ignited.

Regarding the probability of acetylene exploding by coming in contact with the hot inner wall of the cylinder: This would depend upon the temperature of the metal. It is doubtful if the metal would be warm enough at any time to ignite the mixture; that is, no more so than if the gasoline mixture were utilized. When a cylinder becomes so warm that it will explode any gas vapor with the ignition switched off, the motor should not be operated until the cause for overheating has been removed.

Horsepower Formula.

(139)—Can you secure for me or advise where I can get the formula for computing horsepower? For example: What is the horsepower of a motor having a 4.25-inch bore and 5.75-inch stroke? If this is not asking too much, I would like to see it figured out. J. E. BUCKLEY.
Kansas City, Mo., March 1.

The formula adopted by the Society of Automobile Engineers, which is standard, being generally utilized, is based upon a piston speed of 1000 feet a minute. It consists of squaring the bore and multiplying the result by the number of cylinders and dividing by 2.5. The horsepower for a four-cylinder motor of the bore mentioned is 28.9.

Tire Vulcanizing Outfit.

(140)—We desire a vulcanizer for tires as well as inner tubes for our own use and would appreciate very much having you give us from your experience which vulcanizer would be most practical for our purpose. We are not equipped with electricity and will be obliged to utilize gasoline or some other heating means.
WARNECKE & STIEREN LAND COMPANY.
Karnes City, Tex., Feb. 18.

Vulcanizing outfits utilizing steam are employed largely by garages, etc., and the equipment varies in size from the portable device for the motor car to those adapted to the tire repair business. Chas. E. Miller, 97-103 Reade street, New York City; the National Motor Supply Company, 1911 Euclid avenue, Cleveland, O., and the Williams Foundry & Machine Company, Akron, O., are among those who manufacture a wide variety of these vulcanizers and will furnish information upon request.

Cylinder Pressure.

(141)—What is the number of pounds pressure, reckoned according to any standard pressure gauge, of the air in the cylinder of a gas engine like those used on automobiles, when the piston is at its highest point, assuming that there is no leakage? S. O. PITTS.
Archer, Neb., March 5.

The pressure when measured with a standard pressure gauge will vary according to the design of the motor. In some types it may be as high as 75 but this is the exception rather than the rule. From 40 to 75 pounds would be a conservative estimate.

Voltage at Magneto Terminals.

(142)—What is the correct number of dry cells to use with a Bosch double ignition system such as is used on the ——— car and why? What voltage is delivered at the spark plugs by the Bosch step-up transformer with the dry cells reading six volts? What voltage is delivered at the magneto terminals of a Bosch magneto at ordinary engine speed? H. P. LASHER.
Cushing, Ia., March 2.

The Bosch Magneto Company, New York City, advises the use of two sets of five dry cells in series parallel with a dual system. Regarding the voltage delivered at the spark plugs by the Bosch step-up coil with dry cells reading six volts: This is a difficult question to answer, owing to the fact that this being a straight induced current, there are no instruments made for the purpose of measuring the same. The only way that coil voltages and magneto voltages are measured is by the distance the spark will jump across in the open air.

Relative to the Knight Motor.

(143)—Will you kindly inform me what automobiles are equipped with the silent Knight engine? What machines are fitted with the electric starting device, same as is employed on the Cadillac, and what makes, if any, furnish the Edison instead of the Exide battery, for storing the current? HORACE P. TOBEY.
Wareham, Mass., March 1.

The machines licensed in this country to fit the Knight engine consist of the Columbia, Stoddard-Dayton, Stearns, Edwards and Lyons-Atlas. Regarding the machines fitted with the Delco starting and lighting system the Dayton Engineering Laboratories Company, Dayton, O., maker of the device, could supply the necessary information. As to the battery, the Edison Storage Battery Company of Orange, N. J., would be the proper concern to give the information required.

Timing K-W and Remy Magnetos.

(144)—Will you kindly give me the correct method of timing the K-W and Remy magnetos? Do you set the inductors about .0625 inch from the pole pieces as you do a Splitdorf or Bosch, or adjust the cams so that the points begin to separate and the brush just touching the segment? H. W. P.
San Francisco, Cal., Feb. 22.

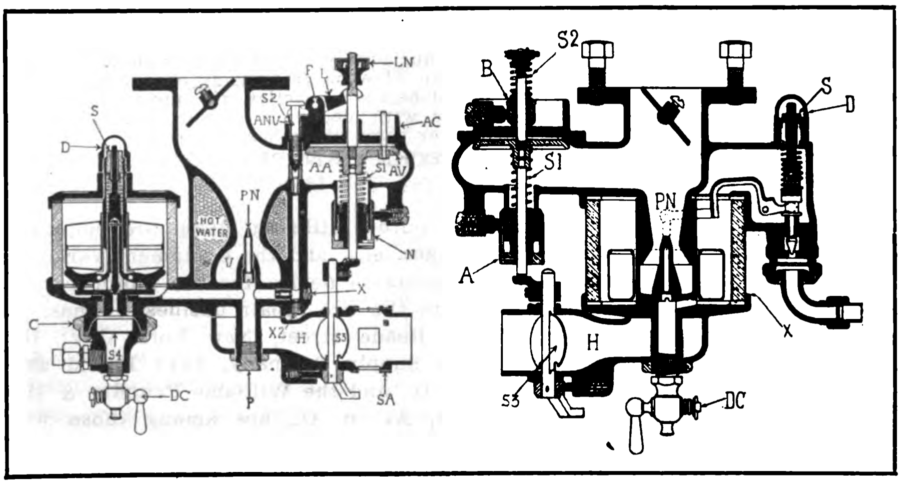


Fig. 1—Depicting the Components of Stromberg Carburetor and Adjusting Mechanism—Model B Is Shown at the Right and C at Left.

The timing of the Remy magnetos is by the break of the contact points, which are separated by the cam. The piston of the cylinder to fire should be placed upon exact dead firing centre and the cam housing should be in a fully retarded position. The platinum points are just separating, but not touching. There is but one adjustment, that of the contact screw, and this should be so set that the maximum break of the points is betwen .025 and .03 inch.

If the motor misses with the spark retarded, and shows indications of skipping more at low than at high speeds, the contact screw should be screwed out a notch at a time until the trouble is overcome. If the engine misses with spark advanced, the contact screw should be screwed in a notch at a time until the motor runs evenly at high speeds.

The K-W true high-tension types of magnetos are timed easily, the operation being similar to the instrument just described. The firing point is when the platinum contact points of the circuit breaker are just beginning to break apart, not when they touch. The location or position of the distributing brush is similar to other type of magnetos.

The Remy Electric Company, Anderson, Ind., maker of the Remy magneto, and the K-W Ignition Company, Cleveland, O., will forward, upon request, complete instructions regarding the installation of their instruments.

Ford Transmissions.

(145)—Can you inform me if the Ford Motor Company ever fitted a transmission other than the planetary to its cars? FORD OWNER.
Cleveland, O., Feb. 26.

The Ford Motor Company always has installed the planetary type of transmission on its cars.

Adjusting Stromberg Carburetor.

(146)—My motor car is fitted with a Stromberg carburetor which became filled with dirt through not straining the gasoline. I took the carburetor down to clean it and since replacing it on the machine, it does not act right. Not having adjusted one of these members and having lost my instruction book am writing for information as to its adjustment. CONSTANT READER.
Stonington, Conn., March 13.

In disassembling the carburetor it is probable that the adjustment of the speeds was changed. As the model was not stated, the method of setting both B and C are given herein. At Fig. 1 is presented the components of both types that of B being the right and C at the left in the drawing.

To adjust model B, turn on the gasoline and note the level of the fluid in the float chamber. It should be about .9375 inch lower than the lower edge of the glass marked X. This level is adjusted properly at the factory and should not require any attention. If wrong remove the dust cap D and turn the adjusting screw S until the proper level is obtained. If the fluid be too high, screw the nut down. If too low screw the nut up.

Next start the motor by closing the valve S 3 in the hot air horn H. The engine should start on the second or third crank. To adjust the low speed turn nut A until the spring S 1, which is the low speed spring, seats the valve lightly. Note that the high speed spring S 2 above B is free and does not come into contact with the nut on top of the auxiliary air valve stem. Next turn the nut A up or down until the motor idles properly.

To set the high speed, advance the spark and open the throttle. If the motor backfires through the carburetor, turn the high speed adjusting nut B up until the backfiring stops. If, however, with this adjustment and running at low speeds the motor operates erratically, the mixture is too rich. The nut B should then be turned down until this trouble is overcome. The spring nut B should always have at least .03125-inch clearance between it and the nut at the top when the motor is at rest.

The type C is provided with two separate gasoline spraying nozzels. The primary member P N is located in the centre of the carburetor and supplies sufficient fuel for all speeds up to 20 or 25 miles an hour. The second or auxiliary nozzle A N, is mounted just beneath the secondary gasoline needle valve A N V in the auxiliary air passage A A. The auxiliary needle is raised by a lever L operating over a fulcrum F by the opening of the auxiliary air valve A V.

To obtain the low speed adjustment, turn the nut N located beneath the auxiliary air valve so that the valve is brought up to seat, then give two full turns to the right for pressure. This valve should not operate when the motor is running idly. Next, turn low speed nut N up or down until the motor operates slowly, then advance the spark and open the throttle. If a backfire follow, turn nut L N down until it ceases. If the mixture be too rich, turn it up. Be sure that nut L N and lever L have some clearance on low speed.

The high speed is regulated by the lock nut L N on top of the auxiliary air valve. Raising or lowering it determines the point at which the auxiliary needle valve A N will be brought into service. It is seated by the high speed spring S 2. The lock nut L N should be about .09375 inch above the lever L for normal adjustment, but this distance can be increased or decreased to suit the motor. Richness of mixture may be determined easily by noting the odor of the exhaust. If rich it will be pungent.

Grades and Gear Ratios.

(147)—Kindly tell me how to calculate grades as to percentage, also how to figure the gear ratio of the transmission? DANA A. LANE.
Hazardville, Conn., Feb. 28.

The most common way of designating a grade is in per cent. This is figured on a given horizontal distance of 100 feet, for example, and the difference there is in the height of the hill at either end of that 100 feet. If the rise be 10 feet, the ratio is 10-100 or 10 per cent. Similarly, any rise as 17 feet, is 17 per cent., always remembering that the horizontal distance is 100 feet. A 100 per cent. grade would be one in which the rise was 100 feet in horizontal distance. Shorter horizontal distances, of course, can be used in figuring, as, for instance, a rise of three feet in 10 equals 3-10, or 30 per cent. Or one foot in 20 equals 1-20, or five per cent. With a rise of five feet in five, 10 feet in 10, 100 feet in 100, or whenever the rise is equal to the horizontal distance, the grade is 100 per cent. or 45 degrees.

In measuring grades in degrees, the foundation is the circle which contains 360 degrees. A line drawn horizontally across the circle through the centre is the level and a point in the circumference is considered as the top of the hill. Then a line drawn from this point to the centre of the circle would form an angle with the horizontal line, and the angle would contain as many degrees as there were degrees in the circumference of the circle between the point considered as the top of the hill and the point where the horizontal line cuts the circumference. The side of a house forms a 90 degree angle with the street level. Cutting this in two would give a slope, as on the roof of a dwelling, an angle of 45 degrees.

No motor car could stand on this grade or climb it, unless some other means besides ordinary roads and tires were used. It has been found that ordinary traction ceases on a slope of about 26 degrees or a 57 per cent. grade. A simple method of measuring grades is to attach a piece of stout string to a top iron or any other convenient place on the automobile, and as near as possible over the edge of the running board. The twine should be long enough to drop a few inches below the board. Next tie a weight to the free end, taking care that the twine moves freely so that the weight will act similarly to a pendulum.

Next drive the machine upon a level space, such as the floor of the garage, and mark the intersection of the string on the edge of the running board. The string now hangs perpendicular from the point where it is suspended. In driving up a hill the twine will move backward and in descending a grade it will move forward. As the car stands upon the grade to be measured, mark the spot on the running board where the string intersects. For convenience call the point where the twine is attached A, the point of intersection on running board B, and location of string when on a grade C. The length of C B is to the length of A B as the per cent. of the grade of the unknown slope is to 100 per cent. For example: If it be eight inches from B to C and 40 from A to B, then the per cent. is equal to eight divided by 40, which results in a fraction of one-fifth or 20, thus determining the grade to be 20 per cent.

A free swinging pendulum and a scale marked on a piece of board to swing either way from zero is made easily and also may be utilized. There are devices called gradometers which are not expensive and these register the grade. They are attached to the dash or any other convenient place.

In figuring the gear ratio of the transmission the gears and pinions of the main and secondary shaft are taken into consideration. Suppose for example that the engine shaft extension carries three gears, beginning at one end, respectively, 19, 32 and 48 teeth, and that the sliding sleeve bears gears of 77, 64 and 48 teeth, respectively. When the 77-tooth gear on the sleeve is slid into mesh with the 19-tooth gear upon the engine shaft, the speed ratio is about four engine turns to one sprocket turn, and the low speed is engaged. When the sleeve is moved until the 64-tooth gear on the sleeve meshes with its 32-tooth mate, the two-to-one or intermediate gear is obtained, and when by a further motion of the sleeve the two 48-tooth gears are meshed, the engine and sprocket shaft are rotating at equal speeds and the car is running on the high. In estimating car speeds the final gear; that is, the ratio between the pinion or driving gear on the shaft and crown gear, should be taken into consideration.

CLEANING OUT RADIATORS.

A repairman of considerable experience recommends the use of sal-ammoniac for cleaning out the circulating system of a motor and states that a pound of this material dissolved in water and poured into the cooler will remove "fur" and incrustations. The fluid should be left in the system and the car operated for two or three days, then removed. If chemical action is going on it will be noted by the odor of ammonia.

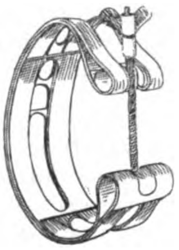
WHEN THE WATER BOILS.

Frequently, in exploring roads unknown to the operator, highways are encountered which preclude the use of anything but the second or low speed, because of their dangerous condition. If the day be warm and the water shows a tendency to heat it is an excellent plan to remove the radiator cap before steam is generated, as by so doing considerable water will be retained in the circulation system that otherwise would boil out through the overflow pipe. When steam is made it displaces a certain amount of water if the cap be on the cooler. By operating with the cap off the steam will escape into the open air and it will be found that the water will not boil nearly as quickly as under normal conditions.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Catelain Hose Clamp is produced by the Power Sales Manufacturing Company, 122 South Michigan avenue, Chicago, and is so constructed that it will fit different sized hose from .75 to four inches outside diameters. It is also claimed that it will retain equally well oblong shaped pieces. It comprises a brass band, .75-inch wide, which encircles the hose and is drawn tight with a screw and brass thumb nut.



CATELAIN HOSE CLAMP

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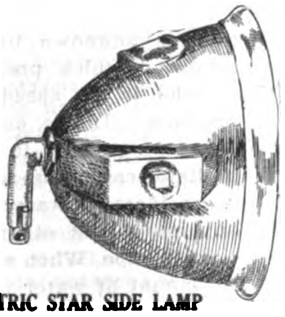
Electric Star, style D side lamps are manufactured by the Milwaukee Bronze Casting Company, 119 Clinton street, Milwaukee, Wis., and a quality is that they are made to fit any type of lamp bracket. They are six inches in diámeter, are free from rivets and solder and have but one essential screw. The lamps are cast of thick, non-corrosive silvered aluminum which takes a very high polish and which maintains its lustre. The metal has a slight bluish tint, which is held to increase the efficiency. Each lamp is equipped with an Ediswan bayonet catch base. The lenses are constructed of plate glass laid in rubber, and the lamps are water, air and dust proof.



ELECTRIC STAR SIDE LAMP

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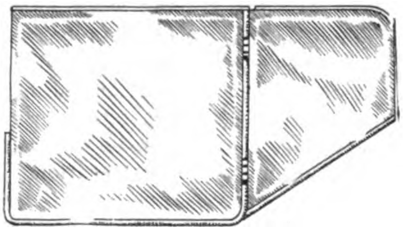
Detroit Fore Doors, manufactured by the Detroit Fore Door Company, Detroit, are designed for attachment to motor cars not provided with these members, and a quality of the construction is that they may be fitted easily by anyone having a knowledge of the use of a screw driver, bit and brace, and a monkey wrench. The doors are of the detachable type and being built of a one-piece aluminum, cannot warp or get out of shape. Each set of doors is upholstered and finished in the standard colors of the car for which it is made and has five coats of paint and two of varnish. The doors are particularly designed for 1911 models of Ford, E-M-F and Hudson machines and are finished in colors to match. In addition to keeping out the cold winds, they add to the appearance of the car, bringing it up to lines of the most modern construction.

DETROIT FORE DOOR



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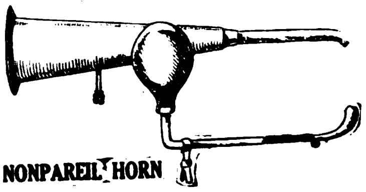
The Nonpareil Auto Horn, marketed by the Nonpareil Horn Manufacturing Company, 73 Wooster street, New York City, is of the concealed type in that it is designed to be located under the hood. It is very compact and is said to produce a considerable volume of deep, penetrating sound. It is operated by air, the bulb being located under the steering wheel.

Texaco is an oil made by the Texas Oil Company, New York City, and is guaranteed not to congeal at any temperature down to zero. The Texas company has large oil fields in many parts of the country and its line is complete in every respect. The Texaco engine oils are held to be remarkably free of carbon, thus eliminating all depositing features, and are refined to obtain perfect combustion in engine cylinders at high temperature and also to remain fluid in zero weather. Owing to the special filtration methods it is maintained that the oil will burn up cleanly.



NONPAREIL HORN

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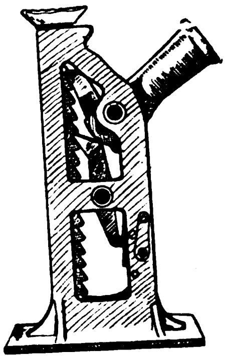
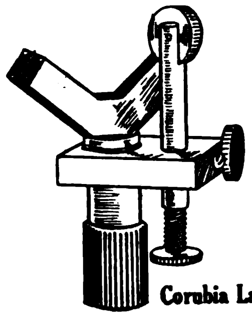
The Pratt Auto Jack is the product of the William E. Pratt Manufacturing Company, 91 Lake street, Chicago, and qualities emphasized are light weight, compactness and ease of operation. They are constructed of galvanized malleable iron and the five parts are secured by two bolts. They may be raised or lowered one notch at the time, on the downward stroke, a small trigger device being moved to bring about the desired movement. J. J. Kelleher, 612 Columbus avenue, Boston, is distributor.



PRATT AUTO JACK

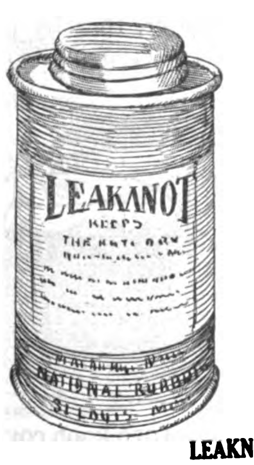


Corubia Lamp Lighter

The Corubia Lamp Lighter, produced by the Corubia Manufacturing Company, 71 Third avenue, New York City, is a lighting device for attachment to acetylene lamps. It comprises the burner to which is clamped a brass pillar mounting a highly tempered file wheel held in contact with a piece of sparking metal by a spiral spring, the tension of which may be regulated by a thumb screw. The wheel is actuated by finger pressure and the operation results in a shower of sparks which ignite the acetylene. The spark metal is said to be very enduring and the lighter is moderate in price.

* * *

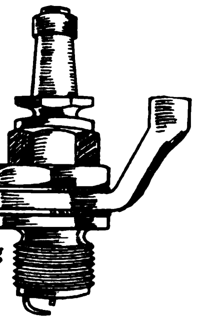
The Rajah Starting Plug was brought out recently by the Rajah Supply Company, Bloomfield, N. J., and the plug proper does not differ from those made by this company except that a device has been added, whereby the cylinder may be charged with gas. The mixture is introduced into the combustion chamber through a hollow yoke which is secured to the shell of the plug by a jam nut. Above and below the yoke are copper asbestos gaskets, which prevent the escape of the gas, which is conducted to the centre of the plug. It is stated that the plug may be taken apart and cleaned without interfering with the gas piping.



LEAKNOT

* * *

Leaknot is a liquid, water proof rubber dressing manufactured by the National Rubber Company, St. Louis, Mo. It is adaptable for coating leather, such as the top or upholstery, and the maker holds that it is colorless, odorless and will not injure the material, which it rubberizes. One of the qualities emphasized of the preparation is that it softens leather.



Rajah Starting Plug

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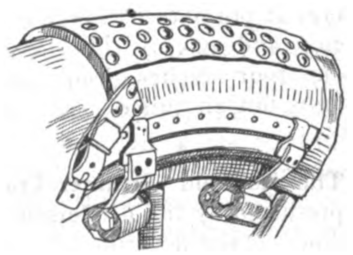
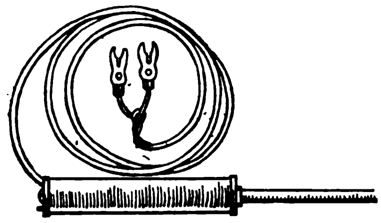
The Universal Tire Protector, manufactured by the Universal Tire Protector Company, Angola, Ind., differs from those of usual form inasmuch as the device is mechanically anchored to the shoe. It is designed for attachment to a tire which presents symptoms of weakness or a shoe which has blown out. The tread is provided with metal studs, making for durability and traction, and the boot also is provided with a rim arrangement to which are secured straps, these being tightened by a locking device. It is pointed out by the maker that the protector may be applied and locked in a very few seconds, as well as drawn tightly over the casing.



Universal Tire Protector

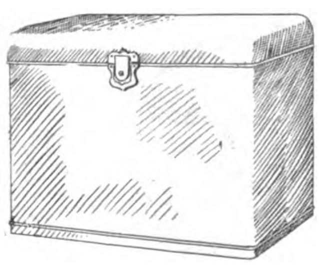


Magnetic Lifting Tool

The Magnetic Lifting Tool, marketed by the Sypher Tool Manufacturing Company, 2208 Warren street, Toledo, O., is a useful device for the repair shop or garage as by it bolts, nuts, cotter pins, tools or small parts, which have been accidentally dropped in inaccessible places and are not reached easily with the hands, may be taken out. The instrument weighs 2.5 pounds, is 12 inches in length and the magnets are operated by electricity supplied by dry cells or a storage battery. It is actuated by a press button on the end of the handle, thus closing the circuit, and as the tool is in service but a short time but little current is consumed. The device is provided with several feet of flexible cord, has a polished brass case surrounding the windings and is inexpensive.

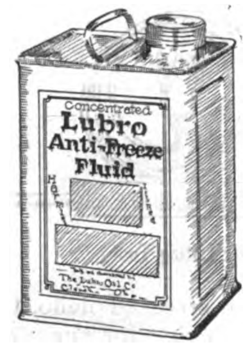
* * *

Mitchell Boxes, manufactured by G. F. Mitchell & Son, Cleveland, O., are made in several different styles and dimensions to meet individual requirements. They are constructed of steel and a quality claimed is neatness of design and fit of covers. Each box is equipped with a Yale lock, the maker holding that it is the best obtainable and that it eliminates duplication of keys. The boxes are neatly finished. Tank members also are supplied.



MITCHELL STEEL BOX

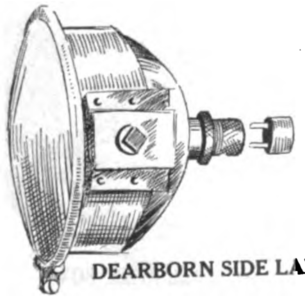
Lubro Anti-Freeze Fluid is manufactured by the Lubro Oil Company, 116 Prospect avenue, N. W., Cleveland, O. It differs from the usual anti-freezing solutions in that it does not require testing from time to time with an instrument to ascertain the freezing temperature. The fluid is red and its strength may be determined by the color which fades as it weakens. Being a bright color it is a simple matter to locate leaks in a radiator, and the garage man is prevented from drawing off the fluid by mistake. The maker also emphasizes the fact that Lubro does not boil or evaporate as easily as water and that it keeps the cooling system free from rust and corrosion. Another quality is that it is of a lubricating nature. One gallon added to 3.5 gallons of water provides sufficient fluid for the ordinary radiator. Lubro comes in gallon cans and is moderately priced.



LUBRO ANTI-FREEZE FLUID.

* * *

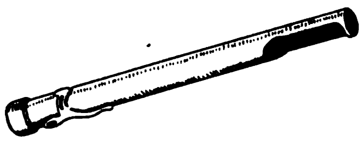
Dearborn Electric Sidelights are produced by the Dearborn Hardware & Lamp Manufacturing Company, 2911 Carroll avenue, Chicago, and it is claimed these lights will withstand hard service and provide good illumination. They are constructed of one-piece heavy brass and the side brackets are securely riveted. The interior is heavily silver plated and highly polished, and a focussing device of solid brass, operated from the outside, is a feature of the design. It is fitted with an Ediswan socket, also a complete connector made of genuine hard rubber. The lamps are six-inch and are moderately priced.



DEARBORN SIDE LAMP

* * *

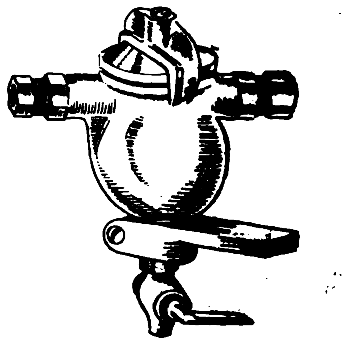
The Matchless Pocket Lighter, marketed by the Schiller Manufacturing Company, Chicago, is a compact, seamless tube, nickel plated and containing gasoline or alcohol, which saturates a wire mounted fireproof wick. The fuel is ignited by a plunger carrying a piece of "Pyrofor," capable of 5000 ignitions. It is used in a manner similar to striking a match and the shower of resulting sparks ignites the wick member. When the plunger is in service a spring with a cap and sponge is compressed, forcing the fluid above the sponge and keeping the wick saturated. The shoulder is tapered, hermetically sealing the receptacle tube, but the knurl makes it possible to remove it evenly and quickly. The lighter is four inches long and weighs but an ounce.



MATCHLESS LIGHTER

* * *

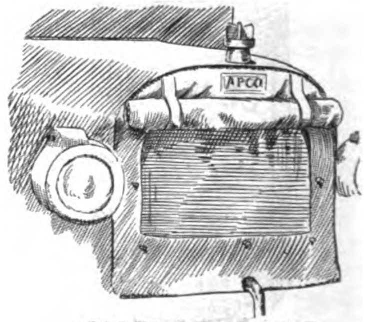
The Rayfield Strainer-Trap is produced by the **Findeisen & Kropf** Manufacturing Company, maker of the Rayfield carburetor, and is installed in the main fuel line between the source of supply and the vaporizer. It is a valuable component of the carburetion system, in that it not only separates water and foreign elements from the fuel, but prevents them from reaching the carburetor and creating trouble. The gasoline enters at one end, flows directly to the bottom of the trap, and in rising to pass out, passes through a very fine metal screen. All accumulations are left in the bottom and may be removed by means of a petcock. A brace is provided with the strainer for attaching to any convenient frame or other car member. The device is five inches high and 2.5 wide, and is constructed to take .25, .3125 or .375-inch outside diameter tubing. It is made of brass, nicely finished and is moderately priced.



RAYFIELD STRAINER-TRAP

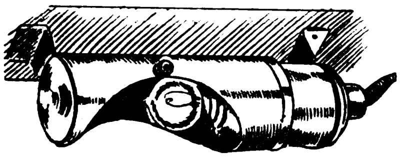
* * *

The Apco Ford Hood Cover is marketed by the Auto Parts Company, Providence, R. I. It is designed to keep the water in the circulation system warm and the motor at the same time. This makes for easy starting when the machine has been exposed to the cold as the cover completely envelopes the hood and radiator, retaining the heat for a considerable period. It is constructed of rubber cloth, well stitched and padded with felt, and is equipped with an adjustable curtain. The cover may be left on all winter, thereby protecting the power plant from rain or sleet, and being neatly constructed does not detract from the appearance of the machine.



APCO FORD HOOD COVER

The curtain may be lowered or raised as desired and is secured by curtain fasteners. The device is moderately priced and replacing the blanket prevents possible theft of that member when the car is left alone.



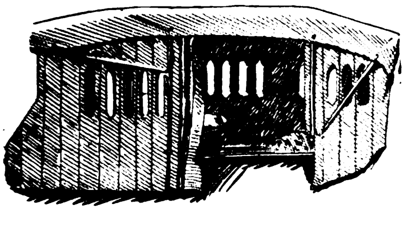
CLEVELAND TOP LIGHT

★

The Cleveland Top Lamp, manufactured by the Cleveland Electric Storage Battery Company, 116 Market street, St. Louis, Mo., is an electric member for lighting the tonneau of the motor car equipped with a canopy top. The bulb is contained within a sturdy metal casing which is secured to the bow of the top. A shutter is provided, affording protection to the bulb when the top is folded. The lamp comes complete with suitable length of flexible cord, and is inexpensive.

★

The Applas Inside Curtain is produced by the Applas Curtain Company, 601 Ford building, Detroit, and in addition to being very neat in appearance provides means for completely and quickly enclosing the body, thereby protecting the occupants against the weather. It is accordion pleated and suspended from nickel plated rods which extend from bow to bow. When not in service the curtains are held flatly against the underside of the bow, entirely out of the way, preventing breakage of the celluloid lights. A ring is attached to each pleat, permitting sliding, which operation folds it automatically. Means are provided for securing the curtains when in position, as well as for attaching to the body. A multiplicity of windows make for excellent lighting of the car's interior.



APPLAS INSIDE CURTAIN

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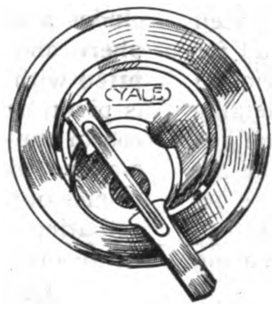
The Crary Gasoline Lock, manufactured by the Crary Gasoline Lock Company, Detroit, is as the name implies, a device for shutting off the supply of fuel from the main tank to the carburetor, thereby preventing the use or theft of the automobile by others than those in possession of the key. The locking device is similar in appearance to the ignition switch and is located upon the dash or other convenient place. Leading from the lock is a flexible steel shaft, enclosed in a tubing to prevent tampering with the actuating mechanism.

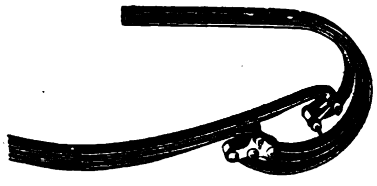


Crary Fuel Lock

The latter is incorporated in the main line between the tank and the carburetor and a simple movement of the lever key closes a valve member, securely locking the fuel. The lock is a Yale and the key is removable. The device not only prevents theft of the car, but enables the owner to shut off the fuel, eliminating loss by flooding of the carburetor. The Crary fuel lock is constructed of high grade material, nicely finished and easily installed. For convenience and practicability the device is recommended by many.

★

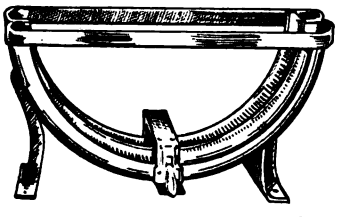
The Huston Multiple C Spring is produced by the Huston Multiple C Spring Company, Philadelphia, and replaces one of the usual members. It comprises a number of proportioned scrolls, and the main member is supported from the top plate of the supporting spring by a pivoted compensator which equalizes the constantly varying strain among the three leaves. The latter are separated from one another and operated independently. It is held that the device not only makes for easier riding qualities of the car, but eliminates opportunity of spring breakage when traversing rough roads. Economy of tires and better traction are also emphasized in the device. Many makes of springs were carefully studied by the designers before placing this latest product on the market.



Huston Multiple C Spring

★

The Sly Perfect Tire Holder will appeal to the discriminating motorist as its design is such that it may be attached to the running board, instead of the body, thereby saving the latter from disfiguring marks by screws or bolts. The device is sturdily constructed, is neat in appearance and the holder proper is so shaped as to retain the shoe in an upright position. The use of straps, etc., is eliminated, the tire being locked by a strong metal hasp provided with a self-locking toggle member. The brackets supporting the holder are neatly constructed and are bolted to the running board. The Sly Perfect tire holder is made in single and dual form and is inexpensive. Smalley Daniels, 247 Jefferson avenue, Detroit, is sales agent.



SLY PERFECT TIRE HOLDER

Recent Patents of Interest

Wainwright Shock Absorber.

A shock absorber which differs from those of the bumper type in that a spring device is incorporated in the rubber, has been patented by Richard T. Wainwright, Rye, N. Y. It is barrel shaped and means are provided for attachment to the body and axle of a vehicle. The resilient rubber member has a longitudinally disposed opening surrounded by a cylindrical spring imbedded in the rubber which is so shaped as to resist tensional and torsional stresses.

Sims Armored Tread.

Bona Sims, Valley Spring, Tex., has been granted a patent for a flexible armored tread for pneumatic tires. It is applied to the exterior of the casing and comprises a number of metallic plates which are diamond shaped and arranged divergently with respect to the plates of the adjacent row. Other plates are employed, these being similar in shape and both types are linked to one another. Means are provided for securing the outer row of plates to the casing.

Currin Dust Cap.

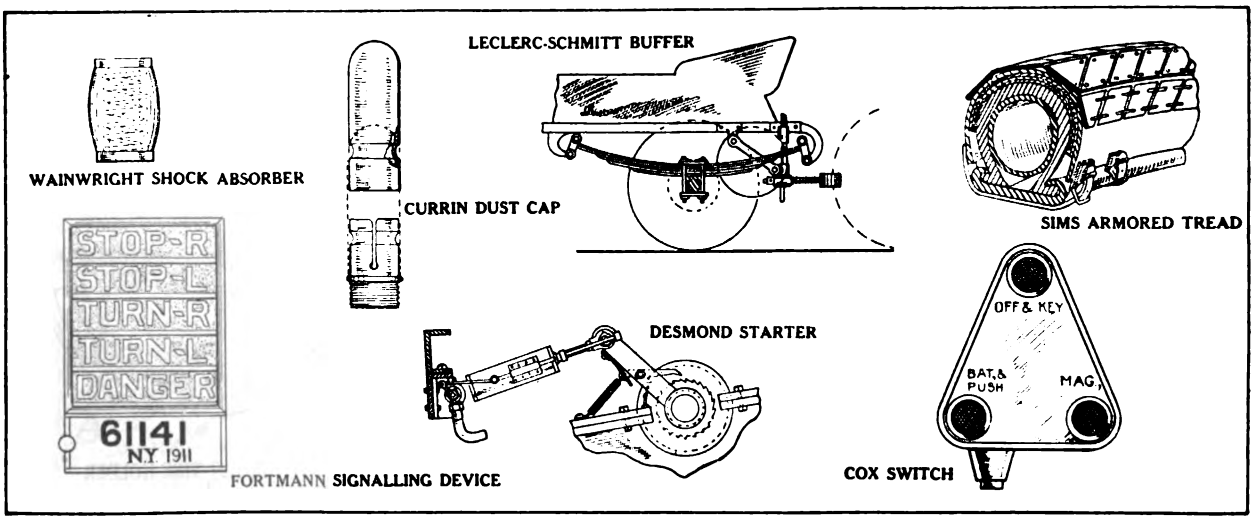
In pumping additional air into the tube of a pneumatic tire and when the valve stem is protected by a dust cap, it is necessary to remove this member, which operation takes more or less time. Sydney Allen Currin, Bristol, England, has patented a dust cap which presents interesting features as it is made in two sections, one of which may be removed quickly when desired. The part that is attached to the felloe of the wheel is threaded and it also has an annular shoulder and a split portion. The upper section has a similar annular shoulder which registers with that on the lower member, securing the portions.

Desmond Motor Starter.

A large number of patents have been granted of late on devices for starting the explosive motor. Among the more recent patents granted is one to John Desmond, Chicago, Ill., assignor to William S. Potwin of the same city. The device operates on the compressed air principle and includes a chamber for the storage of the atmosphere, and actuating means. The motor shaft is fitted with a ratchet and pawl mechanism which is pivotally mounted and operated by the piston rod of the air cylinder. The latter is fitted with a valve which opens and closes at the two extremes of the movement of the piston rod and the actuating lever is returned to its normal position by means of a spring.

Leclerc-Schmitt Rear End Bumper.

Bumpers are generally fitted to the front of a motor car, but a new application of the protecting device is noted in the patent granted Moise L. Leclerc and William Schmitt, New York City, assignors to said Leclerc and Frederick W. Darnstaedt of the same city. The buffer is attached to the rear of the machine and its hanger rods are secured to the frame. Brace links connect the lower portion of the hangers to the frame and



Some of the More Recent Ideas of Inventors Working Along Lines Applicable to the Motor Car, Including an Armored Tire, Shock Absorber, Motor Starter, Rear Bumper, Signalling Devices, Etc.

guide sleeves are fitted through which the buffer rods move. The buffer bar proper is secured to the rods and interposed between the members is a cushioning spring, the movement of which is limited by stop collars.

Fortmann Signalling Device.

Gustave Fortmann, Philadelphia, assignor of one-half to George W. Cook of the same city, has been granted a patent for a signalling device which is a box like member and designed for attachment to the rear of a motor car. The member is divided into a number of horizontal partitions and these are fitted with transparent plates inscribed with suitable words which are illuminated at night. Means are provided for operating the signals as desired as well as for lighting each compartment separately.

Cox Magneto-Battery Switch.

Henry G. Cox, Detroit, has been granted a patent for a magneto-battery switch which comprises two sets of independent circuit terminals, a terminal controlling member, also a flexible support for the latter, and permits a tilting movement into three different positions by movement in the same direction but upon different portions. The controlling member is equipped with means for co-operating with the independent circuit terminals for the opening and closing of each circuit.

Falor Inflating Tube Protector.

Clarence E. Falor, Akron, O., assignor to the Goodyear Tire & Rubber Company of the same city, has been granted a patent for a device to prevent circumferential creeping of tires upon wheel rims, also to protect the inner tube from injury made possible by said creeping. It comprises a tubular member of greater rigidity than the inflating tube positioned around said tube. The intermediate portion of said member where it extends in the wheel rim is exteriorly threaded to receive a clamping nut for connecting it to the rim, one end of said member being provided with a disc shaped lateral flange arranged on the wall of the tire, the opposite end being so designed as to be collapsed against said inflating tube when a valve casing is positioned therein for holding the latter against displacement.

Gray Locking Device.

Emmet P. Gray, Detroit, has patented a locking and releasing device designed for service with signalling apparatus, cut-outs, etc. It comprises a tubular body secured by means of locking nuts and provision is made for the adjustment of these members. The rod operating the lever to which is attached the cable or wire is free to move up or down, and its upper portion is fitted with a head having a recess for engagement with a latch member. The latter is provided with a spring to secure the slidable rod when it is sufficiently depressed.

Regur Motor Starter.

Among the patents granted for starting the internal combustion motor other than by cranking by hand, is the Regur motor starter, patented by Winfield S. Regur, Des Moines, Ia. The device is of the mechanical type, it being operated by a lever located on the outside of the body and occupying a position just back of the gear shifting lever. The end of the starting lever is provided with gear teeth which mesh with similar members upon a ratchet wheel and the latter is mounted upon a sleeve keyed to the power shaft. A casing member is screwed to the disc which is rotably mounted on the sleeve, and a pinion is provided on the casing member and rotably mounted upon the power shaft. The casing also is fitted with a spring actuated pawl which engages the ratchet wheel.

Wear Self-Inflating Tire.

Frank F. Wear, San Francisco, Cal., assignor to himself as trustee, has been granted a patent for a self-inflating and non-collapsible tire that presents novel features. It comprises a wheel having a rim, to which is fitted a pneumatic casing in which is contained sectional inner tubes. Between each pair of tubes is a spring plunger pump. These pumps are mounted on the felloe of the wheel, and comprise an external cylinder, within which reciprocates a small piston controlled by a spring plunger extending into the tire, and bearing upon its lateral interior surface. The plunger is placed between the two sections of inner tube and is so actuated upon by a helical spring as to produce reciprocal movement on the part of the piston of the pump. This action takes place when the tire is displaced in moving over inequalities in the road. Air is admitted to the pump cylinder through a check valve and is discharged on the in-stroke through a small aperture or passage to the tube. In the event of a small puncture in one of the tubes the pump constantly operating would keep it inflated. Provision against over-inflation is not mentioned.

Collard Ignition Apparatus.

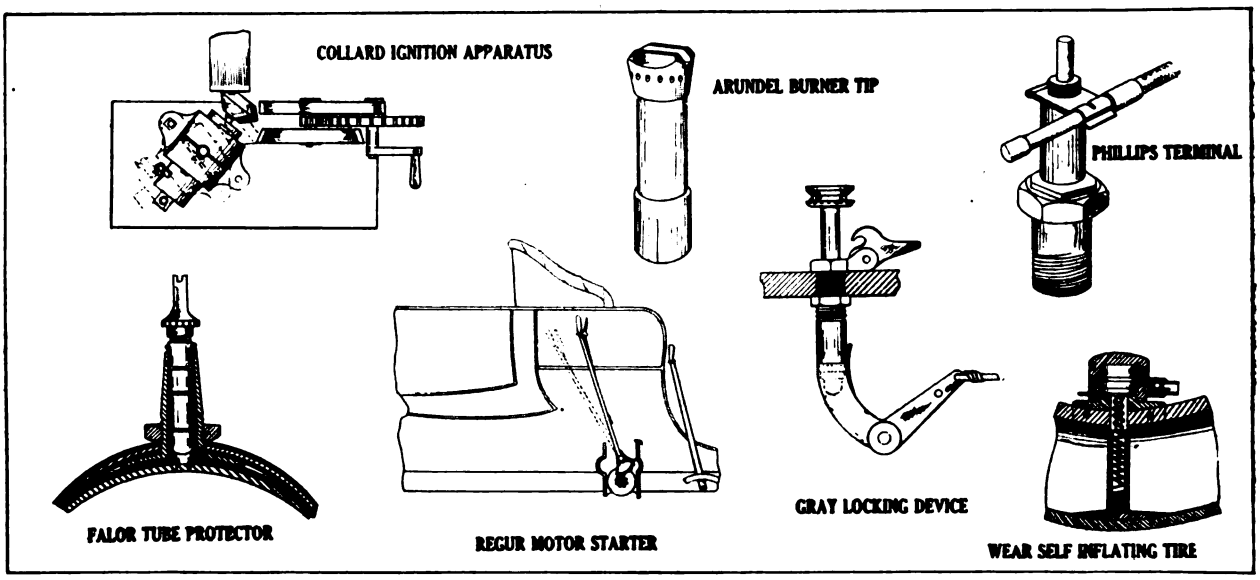
David Edward Collard, Jefferson, Col., has patented an ignition apparatus for explosive motors which differs from those of ordinary construction, inasmuch as the source of current, the magneto, may be utilized when the gas engine is inoperative. The current generator is friction driven off the flywheel of the gasoline motor and is pivotally mounted, and means are incorporated to break the contact as well as to move the dynamo into contact with the manually operated device. The latter includes a wheel member which engages with the bevel of the dynamo pulley and energy is imparted through gears operated by a crank. By it the inventor claims that the gas engine may be started on the dynamo when the motor is idle and that batteries are eliminated. The mechanism provides for a return of the dynamo pulley into engagement with the flywheel upon the engine starting.

Arundel Gas Burner Tip.

Clarence E. Arundel, Washington, D. C., assignor of one-third to William F. Roberts of the same city, has been granted a patent for an acetylene gas burner tip. It resembles the ordinary gas burner in conformation and has oppositely disposed side walls with a floor or recess, said floor having a central orifice elongated transversely of, but remote from, the side walls. Air ducts are incorporated to supply air between the gas exit and the side walls. The streams of gases impinge upon each other and splay longitudinally of the depression and side walls.

Phillips Terminal.

A patent for a spark plug terminal has been granted to Ross M. G. Phillips, Minneapolis, Minn., assignor, by mesne assignments, to Henry Deutsch, trustee. The device is so constructed that the cable or wire carrying the current may be detached from the spark plug when desired. The cable is fitted with an extension of conducting and non-conducting material, the former transmitting the electricity to a metal attachment secured to the terminal of the plug. The clamp is held securely by the spark plug nut and is provided with spring jaws which engage and hold the cable terminal which may be removed or replaced as desired. The inventor points out that the device permits of breaking the circuit and that its testing is made easy and without the use of tools or the operator receiving a shock.



Recent Developments in Motor Car Equipment, Making for Convenience, for Which Patents Have Been Granted.

Miller Tire Puncture Finder.

The customary method of locating small leaks caused by punctures to an inner tube is by immersing the inflated member in a tank of water when the puncture is noted by the air bubbles. Francis Miller, Bellevue, Ky., has invented a tire puncture finder which eliminates the water tank, as the device is so designed that it is clamped about the tube and over the suspected punctured wall. It comprises a ring adapted to completely encircle the tire and is provided with an annular air chamber communicating with a bubble blower detachably secured to the ring. The bubble detector device is fitted with a nipple screw threaded into the ring, the nipple threads being adapted to engage into the air valve of the tube. Leaks from punctures are denoted by the bubbles given off, these being created by the escaping air.

OTHER PATENTS GONE TO ISSUE.

Kraemer Valver Lifter, Edwin N. Kraemer, Cedarburg, Wis. A valve spring lifter comprising a pair of pivotally connected levers which are contracted or extended by means of a threaded rod actuated by a wing nut.

Motor Starter, Wilmur F. Boa and Karl Schoenbauer, Grand Rapids, Mich. Coacting jaw clutch members are utilized having release members and means are provided for breaking the engagement of the starting crank member with that rotating the motor shaft.

Face Protector, Oscar H. McQuary, Jr., Lawrence, Kan. A device for protecting the face comprising a shield for the nose and mouth, also goggles secured in the eye holes. The material is flexible.

Friction Clutch, William J. Hilliard, Elmira, N. Y., assignor to Charles H. Knipp of the same city. A friction clutch, having a number of rings, of inside and outside gripping members, a plurality of cylindrical cams fastened upon the outward side of the outside member, cross bars engaging said cams and revolubly mounted on the hub of the clutch, and means for turning said cross bars.

Motor Starter, Peter W. Kane, Chicago, assignor to the Kane Machinery Company of the same city A mechanical starter comprising a ratchet member mounted upon the shaft of the motor. The actuating arm or lever is fitted with a pivotally mounted pawl one end of which is provided with a similar member. The latter is brought into action in the event of the shaft rotating in a direction opposite to that in which it is intended to move.

Resilient Wheel, August Loock, Hayfield, Ia. Between the rim of the wheel and tire are provided slidable rods having springs, and guide plates are utilized to control the movement of the rod members.

Chock, Thomas J. Moss, St. Louis, Mo. A device for chocking motor car wheels, comprising sheet metal plates so constructed as to be of triangular formation and a brace for securing same. Lugs are provided for the brace member.

Spring Wheel, Frank M. Beydler, Ashland, Kan. Between the felloe of the wheel and solid tire is interposed a series of S shaped springs, these being secured to a facing strip of the traction member by blocks.

Tire, Angelo C. Rovelli, Philadelphia, assignor of one-half to Max Strozzi of the same city. The shoe is constructed of solid material with the exception of a space which is partially filled by two tension members of resilient material, these being bowed toward one another, and engaging the tire at their inner and outer edges only.

Pipe Wrench Attachment, Edward Brahan, Green Bay, Wis. The monkey wrench is provided with a recessed jaw for the purpose of securing a supplementary pipe jaw, and means are provided for the operation of same.

Automobile Horn, Delroy Fifield, Cleveland, O. A horn actuated by the exhaust of the motor and comprising a tube having a partition therein and a valve disc. The latter has spring fingers embracing the partition, and is located at the mouth of the tube. A pipe is employed for conveying the gases toward the side of the disc opposite to the tube.

Fender, Charles G. Wegner, Baltimore, Md., assignor of one-third to Henry F. Sleepack and Amelia C. Wegner of the same city. It comprises a pair of parallel bars having bifurcated portions forming limbs connected to the axle and mudguards and a cross bar interconnecting the limbs, also a flexible covering.

Motor Car Headlight, Edward O. Clark, Spokane, Wash. The headlight is of the movable, swivelling type, being pivotally mounted and actuated by a rod moved by the tiebar of the car.

FLEXIBLE COUPLINGS FOR MAGNETOS.

ANNOUNCEMENT is made by the Bosch Magneto Company, New York City, of a new adjustable flexible coupling which is adaptable for driving magnetos, etc. The device, which is shown assembled at Fig. 1, permits the driven unit to operate both out of centre and out of line, eliminating the need for exact alignment of the magneto and driving shaft as mentioned by the repairman. Another advantage of the Bosch device is that the magneto may be displaced without disturbing the timing or any part of the driving mechanism.

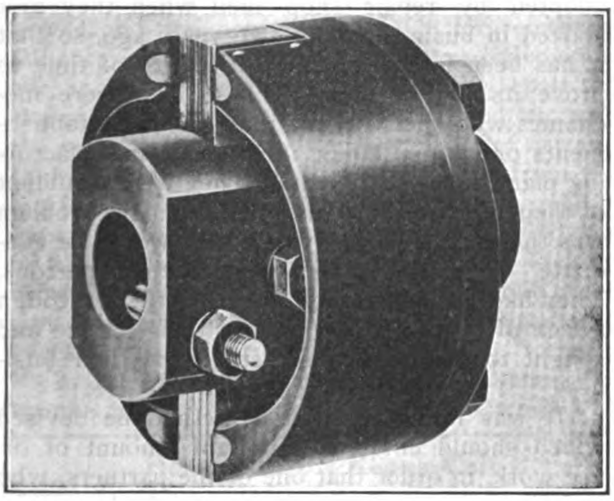


Fig. 1—Bosch Adjustable Flexible Coupling Permitting Driven Unit to Operate Out of Centre or Line, and Change of Timing Without Removing Magneto.

The Bosch coupling comprises a cone shaped piece of steel attached to the armature shaft and terminating in a ring having diametrical fibre lined slots. To the driving shaft is secured a flange that carries a flat crossbar consisting of a large number of fine spring steel leaves or plates. The crossbar fits in the slots or recesses of the cone shaped member, as is shown at Fig. 2.

The laminated crossbar has a marked spring action and permits the two members of the coupling to have a slight relative torsional movement, which is ample to absorb the shock of varying resistance to the rotation of the magneto armature. The spring crossbar also has a slight bending or twisting movement sideways, permitting the two shafts to be slightly out of line. With a rigid coupling the driving and driven shafts must be aligned, and the shock created by the magnetic resistance is transmitted to the driving gears, producing noise. Noisy action is eliminated in the Bosch spring crossbar and ring by lining the cavities with fibre, which in addition, obviates the necessity for lubrication.

The cone shaped member of the coupling is made with proper tapers for various types of Bosch magnetos, a recess being provided for the armature nut. This section is keyed to the armature shaft, while the other member of the coupling may be attached to the driving shaft by a key or the bolt which accompanies the coupling.

Where the adjustable flexible coupling differs particularly from the usual flexible coupling is in the construction of the cone shaped member. In the adjustable type this is made in two parts instead of one, the portion engaging the driving member having a circular groove carrying three bolts with tapered heads, as is shown at Fig. 2, which depicts the disassembled coupling.

The portion which is actually secured to the armature shaft is an ordinary flange having three holes in which the taper headed bolts register. When the nuts on these bolts are set up tight there can be no relative motion between the two portions, due to the binding effect of the taper; so that the sections become as one. Upon loosening the nuts, the magneto armature, together with its portion of the coupling, can be rotated through a complete circle.

A vernier engraved on the stationary portion permits accurate regulation to any degree and on this account the magneto may be mounted on the motor without reference to the timing and the armature set in any position after the entire apparatus is fixed. The construction permits of tests being made to secure the best results from timing without changing keyways, cotter pins, etc.; or in other words, the position of the armature may be altered slightly after installing the magneto, a condition not possible with rigid couplings without considerable labor.

While automobile manufacturers are discussing the advisability of continuing national shows, accessory makers are invited to open a permanent exhibit of their products, to be known as the Auto Centre, in New York City. It is proposed to have each manufacturer in the United States maintain a booth throughout the year, in order to have its product accessible to visitors from every part of the world without the necessity of making a trip to the factory.

John M. Gorham, a New York City attorney, is at the head of the project. He estimates that at least 110 different exhibits will be in place. The idea is considered somewhat novel, but Mr. Gorham is confident that it will accomplish its main purpose to the benefit of producer and consumer.

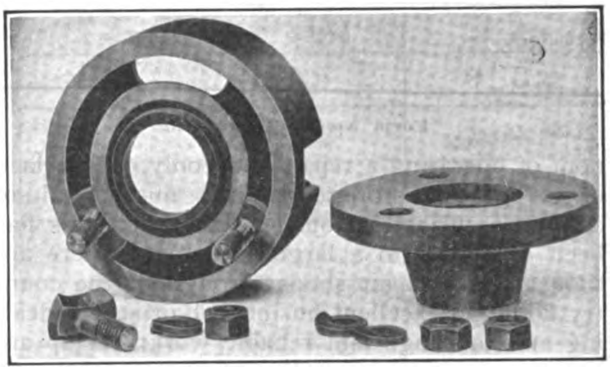


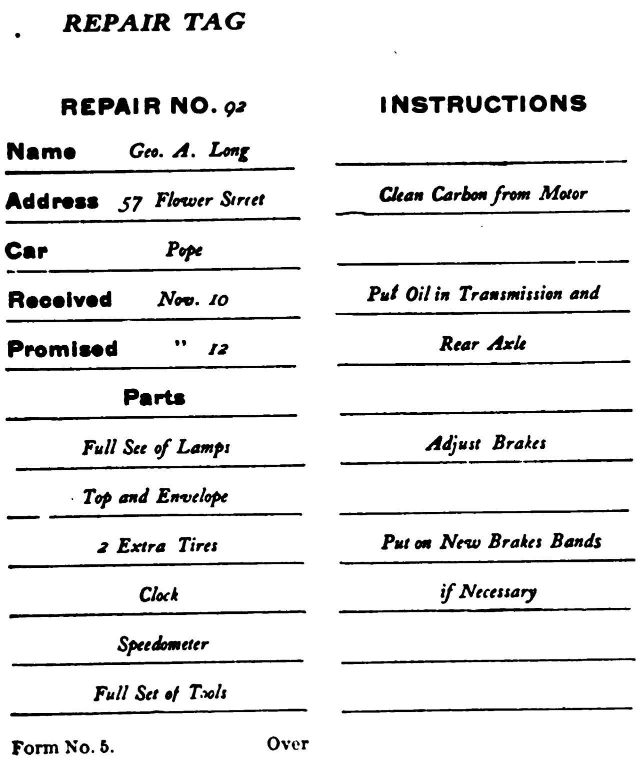
Fig. 2—Showing Components of Bosch Coupling, Including Cone Member, Flange, Crossbar and Bolts.

EXCLUSIVE REPAIR SHOP SYSTEM.

Efficient Method Adopted by Concern Making Specialty of Repair Work for Garages That Do No Repairing for Their Patrons.

THERE is probably no more exacting work in the automobile industry than that connected with the service station and repair shop. Many items are to be considered and to emerge at the end of a month, or any given period, with the business showing a balance on the right side of the ledger requires that close account be kept of each and every item in the various departments. Particular attention should be paid to the matters of stock used, tools required and the labor. These should be checked in a most complete manner, yet with the simplest method possible to avoid confusion.

Much doubt has been expressed as to the wisdom of operating a repair shop only, as the lack of garage and storage facilities might militate against securing patronage. However, this has been overcome to a large extent and there are thousands of repair shops throughout the country doing an excellent business. Fairness of dealing and thorough and reliable workmanship are the main factors that will attract such trade, but another important matter, by no means to be neglected, is the method of rendering such service so that the customer may know he is being treated absolutely fair. This is to be obtained through an adequate system of conducting the service station.



REPAIR TAG

REPAIR NO. *92*

Name *Geo. A. Long*

Address *57 Flower Street*

Car *Pope*

Received *Nov. 10*

Promised *" 12*

Parts

Full Set of Lamps

Top and Envelope

2 Extra Tires

Clock

Speedometer

Full Set of Tools

Form No. 5. Over

INSTRUCTIONS

Clean Carbon from Motor

Put Oil in Transmission and

Rear Axle

Adjust Brakes

Put on New Brakes Bands

if Necessary

Form No. 1—Repair Tag.

The system herein outlined is one that was adopted by repair shop men when they first started in business about two years ago, so that it has been in use a sufficient length of time to prove its practicability. These men were mechanics who had worked in automobile establishments of various kinds, including a manufacturing plant, for several years. They were confident of their mechanical ability, but the main problem was the evolving of a system that would be adequate to secure satisfaction to their patrons. They had witnessed the failure of others through a lack of proper supervision of their service and sought to eliminate this factor from their business.

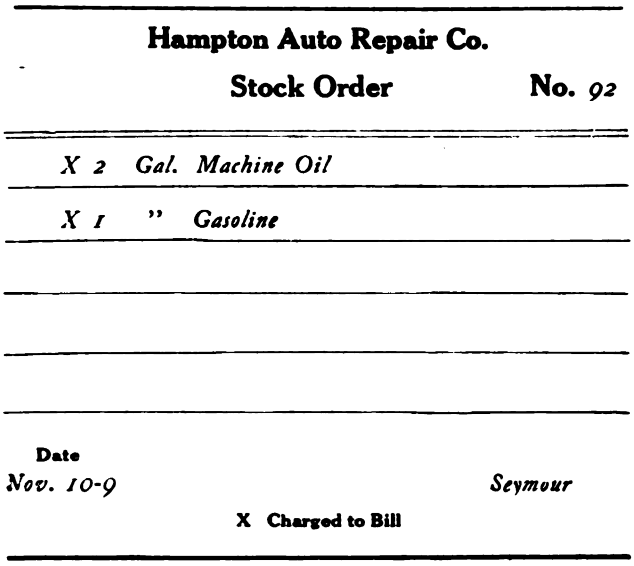
It was necessary that a method be devised which should entail a minimum amount of office work, in order that one of the partners, who had the office work in charge, might have part of his time in which to attend to mechanical work, as each man agreed to take personal charge of a department. Good wages were paid to the workmen, thus securing efficient labor, which justified the charging of good prices for the work performed in their shop. It was agreed at the start that no work should be taken by the job, unless it was understood that the estimate was an outside figure. At the conclusion of the work, if it was found that the cost was less than this estimate, the customer was given the benefit. This plan worked admirably in practise, especially when the customer was made to understand that no accurate estimate could be made of a job, when upon overhauling a car it might be found that the necessary work on hidden parts would greatly exceed the first estimates. Therefore, the outside estimate was made with a view of covering such contingencies, and the customers soon realized they were paying for what they received and no more.

It was also planned to economize wherever possible, the only expense that could not be reduced being the advertising appropriation. Accessories were not dealt in by the company, such necessities being secured outside and the patron being given the benefit of the firm's experience in selection. The chief purpose of the company was to attract business and give a thorough and first class service to garages that did no repairing. With these essentials of the business carried out, the shop organization was attended to and this proved the principal task to assure success.

The system developed had the merit of extreme simplicity and efficiency and it may be applied to any repair shop or service station with equal success, regardless of its size. Each workman was required to have his own kit of hand tools, although the toolroom of the shop was well equipped for all kinds of work. These tools were placed at the disposal of the workmen, but as a guarantee of proper usage a checking system was devised, showing the tools loaned and to whom. Thus it was assured that they would be returned and not left carelessly about, with consequent danger of loss by theft or damage by use in the hands of inexperienced persons.

The books kept by the office comprise a cash book, journal and ledger. These are supplemented by the original records, which are preserved and are instantly available for reference. When a job is received it is given an order number, as will be seen by reference to the repair tag shown as Form No. 1. This tag is filled out with the name of car owner, address, make of car and the date received, which is transcribed from the tag to the bill. The tag, which is of heavy manila paper, is sent to the foreman of the shop and he in turn utilizes the reverse side upon which to write the instruction which outlines certain work and whatever incidentally may be considered necessary.

In the case in question, as shown upon the sample forms reproduced, three men work 14.5 hours on the car the first day, using two gallons of machine oil and a gallon of gasoline for washing the parts. The oil and gasoline are secured at the stockroom, for which a receipt is given and the order received by the one in charge. This stock order, shown as Form No. 2, is given the same number as the repair order and this order identity is preserved throughout the shop. Thus each order checks against the other materials used in the work. A slight mistake would be detected instantly before the bill were made out to the owner, thus guarding against injustice either to the shop or the patron. The stock orders and time cards are taken to the office at the end of each day and are examined, compared, checked and filed.



Hampton Auto Repair Co.

Stock Order **No.** *92*

X 2 Gal. Machine Oil

X 1 " Gasoline

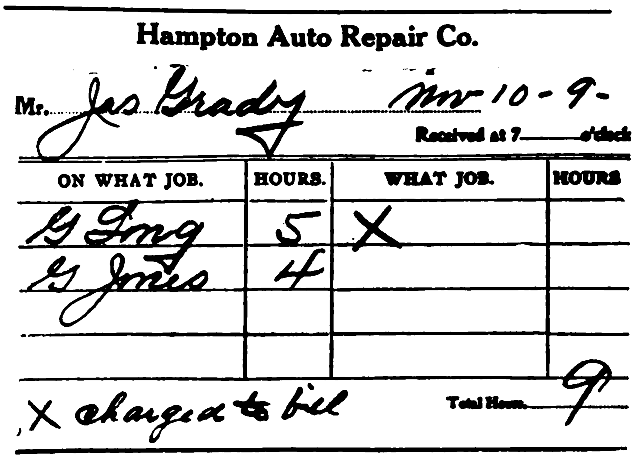
Date

Nov. 10-9 *Seymour*

X Charged to Bill

Form No. 2—Stock Room Order.

The time card, indicated as Form No. 3, carries a complete record of each job performed in the shop and can be referred to instantly in the event of any item being questioned. Many repair shops have been too negligent of this feature of their business in the past and often patrons have been lost as a result. When a man brings his car to the shop it is promised for a certain time and a workman assigned to the job.



Hampton Auto Repair Co.

Mr. Jas Grady Nov 10-9-

Received at 7______o'clock

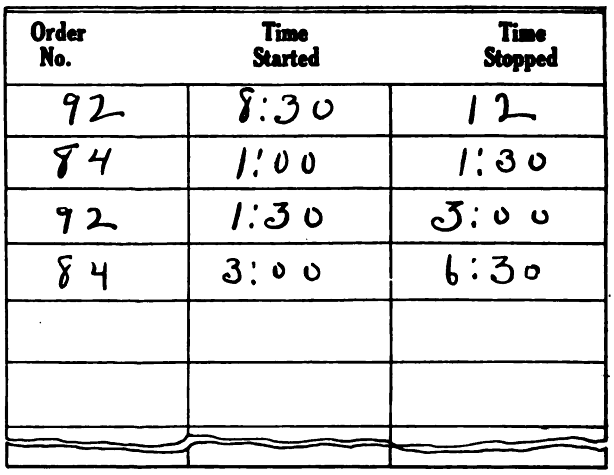
ON WHAT JOB.	HOURS.	WHAT JOB.	HOURS
G Eng	5	X	
G Jones	4		

X charged to bill Total Hours 9

Form No. 3—Time Card.

Perhaps the customer has occasion to pass the shop and observes the workman engaged upon a car at the door—a transient job. Passing again in an hour he may see the workman still engaged in his temporary repair on the transient job. Later in the day when the customer calls for his machine it is ready, but he thinks he has been charged for time expended upon the other. He complains and a dispute arises, but in the absence of a definite record no satisfactory explanation can be given. The customer may possibly take his work in the future to another shop which works upon a more efficient basis, for he feels that he cannot afford to pay for another's lack of system.

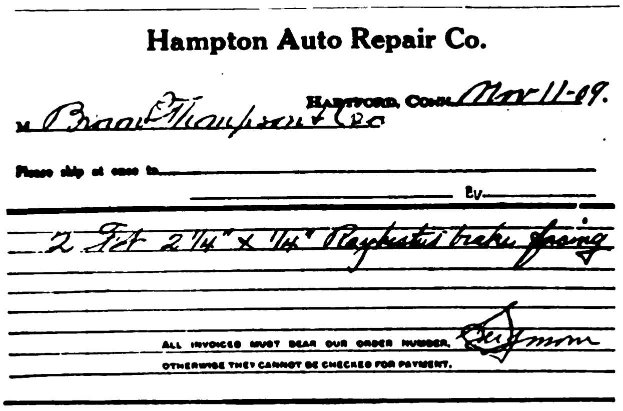
The time card in use by the system under discussion shows that the workman, James Grady, worked nine hours on that particular day, five hours of which were expended on order No. 92, the other four being on another job. To obviate any question the reverse side of this card is arranged to show in detail how the workman expended his time during the day and on what jobs he was engaged. A column is provided to designate the order number, while other columns show the time he started at work and the time he stopped on each job. These figured up at the



Order No.	Time Started	Time Stopped
92	8:30	12
84	1:00	1:30
92	1:30	3:00
84	3:00	6:30

Form No. 4—Reverse Side Time Card.

end of the day give the summary as shown on the card at Form No. 3. The reverse side is shown as Form No. 4.



Hampton Auto Repair Co.

Hartford, Conn. Nov 11-09.

M Brown Thompson & Co

Please ship at once to

By

2 Ft 2¼" x ¼" Raybestos brake facing

All invoices must bear our order number, otherwise they cannot be checked for payment.

Form No. 5—Outside Stock Order.

By comparison of the stockroom order and receipt and the time card it is found that the oil and gasoline were delivered the same day upon which the work was performed on the car. From these cards the customer's bill is filled out each day and brought up to the minute. The stockroom order and receipt is a voucher for the charge on the bill as well as being a record for the delivery of stock.

The second day that the car is in the shop two men are at work on it for 13 hours, the time cards accounting for this. But it is found that the brake bands have to be refaced, for which new lining is necessary. This not being carried in the stock of the shop it is necessary to send outside for the material, which in this instance was secured of a local firm. An order is necessary for this and the blank specifies what is required, the job number being attached. The original order is sent to the firm, while a duplicate is retained in the office for filing purposes. This order form is shown herewith as Form No. 5.

An order is also made upon the stockroom for 32 copper rivets and the following morning the time and stock cards are compared for accuracy and the items are entered on the bill. When the owner calls for his car at the specified time it is ready as promised and his bill is also complete. If there should be any question as to an item the time cards and the stockroom orders are instantly available, and also the record of the order given outside. The bill can be rechecked from the records, if necessary. The bill as completed is itemized and the original is sent and the duplicate retained, this being in loose leaf binding, and indicates each bill remaining unpaid. This bill is shown as Form No. 6. It can readily be seen that few books are necessary as every supply is charged and accounted for in the bills and cards. The records are preserved on file by month and are so arranged alphabetically that they can be consulted instantly. The stock orders also accurately show the stockroom shrinkage, while the outside orders indicate the amounts due by the firm for any reason whatever.

In the case of winter overhauling and general long repairs requiring much work, the order is numbered, and name of owner and address, make of car, car registry number and instructions are written in detail on heavy manila card, in duplicate. The original is retained in the office and the card is attached to the machine, the process being the same as has been outlined heretofore.

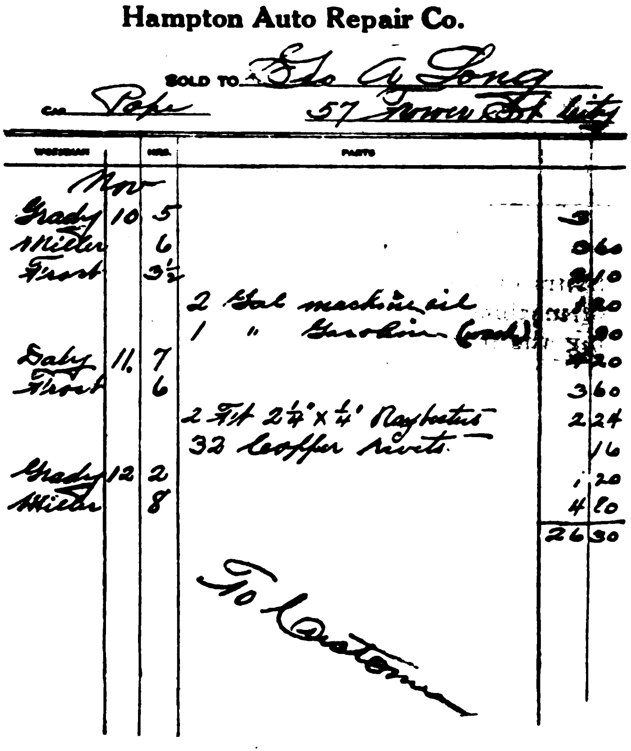
This system has been found to give excellent results. It requires but little time and safeguards the customer and the company, and besides giving every desired fact, indicates precisely each transaction, thus meeting every requirement of the business.

THE FULLY EQUIPPED CAR.

Chas. E. Miller Makes Some Pertinent Suggestions for Benefit of Prospective Purchasers.

According to Chas. E. Miller, 97-103 Reade street, New York City, the well known accessory man, a much more insistent query of the motor car buyer this year than ever before is: "What do I get for my dollars?" Commenting upon this, he says: "The year, therefore, becomes more than ever before the year for the accessory dealer, for, after the buyer has selected the car that suits him in material, design and workmanship, he must next consider the equipment, and this for 1913 consists of speedometers, clocks, windshields, starters, electric lights, tire holders, etc.

"Supposing, for a moment, that the buyer has made a list of the equipment that the car he buys must possess, and if he does, he will find himself up against a difficult proposition. One car may



Hampton Auto Repair Co.

Sold to Geo A Long

Car Pope 57 [illegible] City

Workman		Hrs.	Parts		
	Nov				
Grady	10	5		3	
Miller		6		3	60
Frost		3½		2	10
			2 Gal machine oil	1	20
			1 " Gasoline (cash)		[illegible]0
Daly	11	7		4	20
Frost		6		3	60
			2 Ft 2¼"x¼" Raybestos	2	24
			32 copper rivets		16
Grady	12	2		1	20
Miller		8		4	80
				26	30

To Customer

Form No. 6—The Completed Bill.

have all these equipment features and another only a part of them. It is just here that the dealer in accessories comes to the front because after the car is bought the selection of extras may be made at the buyer's leisure and convenience that will give him entire satisfaction and allow him to provide the necessities that will be consistent with his idea of a fully equipped car."

OPENS NEW YORK BRANCH.

French Maker of Gaulois Tires to Compete with American Manufacturers.

Formal announcement is made of the opening in New York City of a United States selling branch for the Etablissements Bergougnan of Clermont-Ferrand, France, maker of the well known Gaulois tires, and the first shipment of 5000 casings has been received at the headquarters, 64th street and Broadway. Jean Grenier, representative of the French firm, explains that his house has refrained from marketing its product in this country heretofore because of the duty of 35 per cent., which is held to be sufficient to wipe out all margin of profit. The action is taken at this time in anticipation of a material reduction in duty by the present administration at Washington.

It is stated that Gaulois tires have been in use abroad for 17 years and that their reputation is of the best. The company has exhibited at all international expositions since 1900 and has received highest awards at Paris, Turin, Hanoi, St. Louis, Liege, Milan, London, Saratoga, Quito, Brussels and Buenos Aires. It has refrained from making special racing shoes and this is held to explain the fact that the product may not be as well known on this side as some, but it is added that in last year's reliability trials of the French war department, 11 out of the 12 prize winners were equipped with Gaulois tires.

LE GAULOIS FERRE
BERGOUGNAN & Cie CLERMONT-FERRAND

One of the Non-Skid Gaulois Tires.

The Bergougnan works are said to be the second largest in the world. The number of workmen employed is 3500 and the output is in excess of 1000 tires a day. The concern was encouraged to enter into competition with American makers because of the splendid success achieved in Canada, where Gaulois tires are very much in demand, despite the duty of 35 per cent., which also is in effect there. The popularity of this line in Great Britain, South America, South Africa and other sections where all tires are on an equal footing is held to be a strong point in its favor.

Gaulois tires are in four styles, two smooth and two non-skid treads. The smooth treads come in a perfectly round and a squared surface, while the non-skids are either metal studded or with corrugations made from the word Gaulois in raised letters. Both American and French sizes are furnished by the New York branch.

Rhode Island is considering the advisability of a universal lighting law, and it would appear that the bill is likely to be passed in the near future.

An Automobile Trades Association has been organized at Columbus, O. The constitution is modelled after those governing the chapters founded in many of the eastern cities.

ETABLISSEMENTS BERGOUGNAN

Factory of the Etablissements Bergougnan at Clermont-Ferrand, France, Where the Gaulois Tires Are Produced.

VALUE OF PROPER FOCAL ADJUSTMENT.

WITH electricity replacing other illuminants to a large extent, the automobilist naturally concludes that the work of cleaning burners and mirrors, replacing gas tanks and fussing with leaky tubing and carbide has been eliminated. The pressing of a button or the turning of a switch lever when light is desired, appeals to his sense of convenience. While it is admitted that the newer form of illuminant, insofar as the motor car is concerned, requires less attention than the acetylene system, there are several factors which should be given attention if maximum efficiency is to be secured.

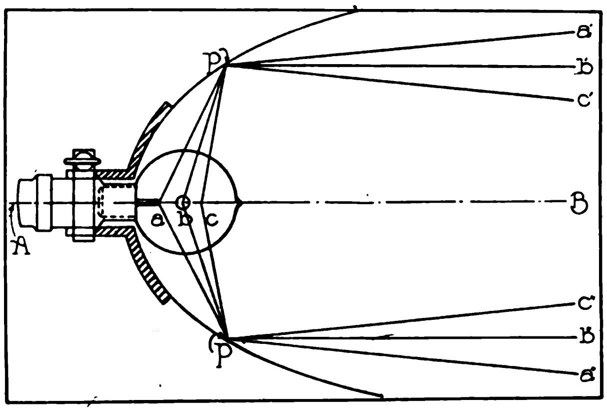


Fig. 1—Depicting Focal Value in Parabolic Automobile Electric Headlight.

The life of a bulb is limited. By this is meant that its candlepower falls off with its length of life and during its latter half, for example, the loss may be 20 to 30 per cent. or more, depending upon the filament. The watts a candlepower are increased proportionately. Variation in voltage, below or above normal, results in less illumination in the former instance and decreased life in the latter. An example of falling off in candlepower is noted in the ordinary incandescent bulbs having carbon filaments. In time the filament loses its brilliancy, becoming dull.

Another factor to be considered is the breaking of a bulb and its replacement. This brings up the subject of focussing the new lamp, a subject that is attracting considerable attention among electrical engineers, some of whom hold that there is still room for improvement in the design of electric headlights. Going a step further, different dimensions of the filament have an important bearing on the character of the beam and this contention is borne out by a series of experiments conducted by the engineering department of the National Electric Lamp Association, Cleveland, O., the results of which are depicted in an accompanying chart at Fig. 3.

The chart shows the distribution curves of a seven-inch parabolic reflector equipped with different types of electric vehicle lamps. Readings were taken 40 feet from the reflector with a Weber photometer. The apparent candlepower of bulbs of varying filaments will be noted by the curves.

The parabola was first fitted with a 52-volt, 15-watt, 12 candlepower Mazda vehicle lamp, a spider wound G 16.5 bulb, .5 by one inch. The test showed that an apparent candlepower of 750 was derived and that the beam was diverging, being in excess of 20 feet.

The second test was made with a 52-volt, eight candlepower, close coil, carbon G 12 bulb, .1875 by .25 inch. In this instance the apparent candlepower was 2750 and the beam 13 feet.

A 70-volt, 15-watt Mazda, 12 candlepower, concentrated type coil filament, G 12 bulb, .25 by .375 inch, showed an appreciable gain over the other forms, in that over 2800 candlepower was secured and that the beam measured 10 feet.

The final test was with a 24-volt, 15-watt Mazda, concentrated type coil filament, G 12 bulb, .25 by .25 inch which gave an apparent candlepower of 6500 and a beam of approximately nine feet. The concentrated filament type is of recent introduction and the distribution curves show that the dimensions of the filament are important factors in electric lighting systems.

When one attempts to alter the distribution of light from a headlight, fitted with the regular six-volt helical coil filament lamp, upon moving the bulb forward or backward along the axis of the reflector, it is found that there is one position at which the nearest approximation to a needle or parallel sided beam is secured. If the lamp be brought nearer the vertex of the reflector a more divergent beam is obtained, while at the same time the field is rendered less uniform. This is made evident from a study of the diagram presented at Fig. 2, which shows three rays of light traced from the lamp, to and from the reflector. It will be noticed that the rays that strike the reflector near the vertex and also those that strike the reflector near the extreme outer edge, are reflected in a direction more nearly parallel to the axis than the rays reaching the reflector at intermediate positions. It is evident that this will result in rings of relatively high and low illumination in the field lighted.

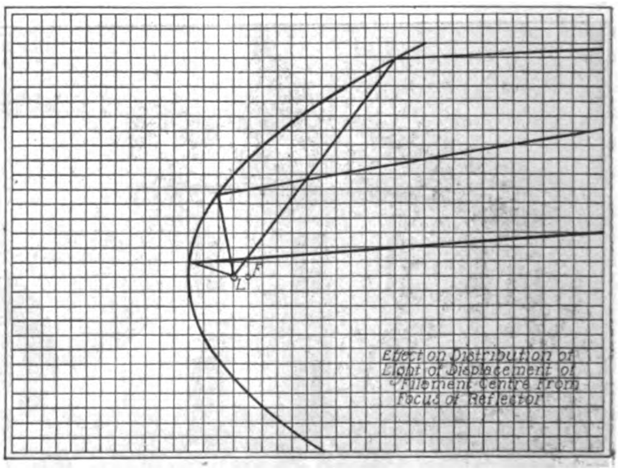


Fig. 2—Showing the Effect of Altering the Distribution of Light from a Headlight.

These diverging and parallel beams, as well as the value of focal adjustment, are shown at Fig. 1. For the benefit of those not familiar with the subject it is stated that upon the proper location of the bulb depends the efficiency of the lamp. The drawing depicts a sectional view of the reflector, lamp and socket. There are three cases to be considered, namely: The filament at the successive positions a, b and c, as denoted. Positions a and c are any two locations behind and ahead, respectively, of the geometrical focus of the deflector, and that at b is at the geometrical focus.

Assume that the centre of the filament is at a. A ray of light emanating from this point and incident upon the reflector at any point as at P will be propagated along the line Pa′. It will be noted then that a system of rays taken through a complete revolution about this point will form a truncated cone of rays. A large amount of light will, therefore, be uselessly dissipated in the air.

In the second case to be considered, a ray of light also striking the reflector at P will assume the direction Pb′. Thus a complete series of rays will form a cylinder parallel to the major axis AB. This is held to be an ideal condition for a long concentrated projection.

Thirdly, a ray coming in contact with the reflecting surface at P will in turn follow the direction Pc′. Concentric zones of light and dark on the illuminated plane will be the result.

From the above it will be seen that in the first case the rays are spread out and that distance projection is sacrificed for a wide display of light on the ground close to the machine. In the second instance, a long projection of light; and in the third case an undesirable collection of light and shadow due to the crossing of the rays are the results. It may be added that there is a certain point at the rear of the focus beyond which the rays are spread out, producing an undesirable illumination. This focal tolerance can easily be ascertained by sliding the socket back and forth in its retaining sleeve and noting the illumination produced. This allowable flexibility makes it possible to adjust to suit a difference of opinion as to the proper driving light. It is very evident that appreciation of the influence of the position of the light source is essential in attaining the best results from the electric headlight, be it a glass or metal reflector.

The Henderson Motor Car Company, Indianapolis, Ind., maker of the Henderson cars, has entered a car in the third annual 500-mile race to be run in that city May 30. William Knipper will be the driver and his mechanic will be Frank Jones, who has ridden with him in many races in the past. The Henderson machine was introduced to the public on the occasion of the second 500-mile race and the entrance of the car in the coming event will be in the nature of a celebration of its first appearance. This will be the first Henderson machine that has taken part in a race meet of this character.

TO PRODUCE HOFF CAR.

Company Organized at La Crosse, Wis., to Promote Design of Hofweber Brothers.

The organization of the Hoff Motor Company, a $1,000,000 corporation, to manufacture automobiles at La Crosse, Wis., is said practically to have been completed. The idea of a factory at La Crosse was proposed by Joseph E. Hofweber of 1606 Jackson street, that city, who has constructed a model car at Detroit, with the aid of his brother, August Hofweber. Should the capital be placed at $1,000,000 eventually, it is understood there will be $250,000 preferred stock and $750,000 of common stock issued.

The tentative plan submitted to the stock subscribers provides for the manufacture of the first 20 cars at Detroit. These will be given a thorough test in various parts of the country before others are made. When the success of the new machine has been demonstrated to the satisfaction of the organizers and stockholders, a plant will be erected at La Crosse and business started on an extensive scale.

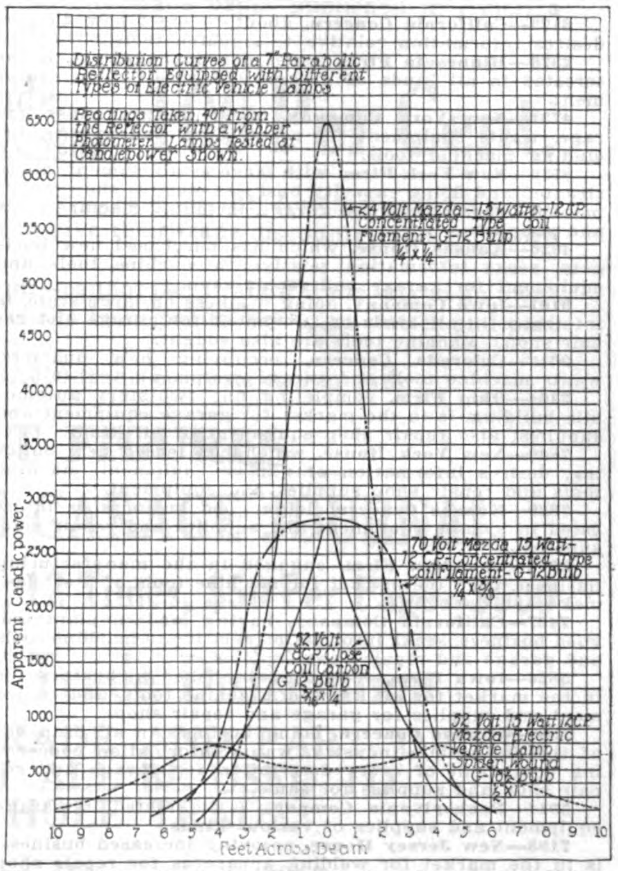


Fig. 3—Chart Depicting Distribution Curves and Effect of Varying the Dimensions of the Lamp Filament—Note the Efficiency of the Concentrated Type Coil Filament.

The Lyons Atlas Company of Indianapolis, Ind., which owns and controls one of the four American Knight engine licenses, has purchased the sample cars, parts, drawings and patterns of the Knight engined cars, which were designed by Harry A. Knox of Springfield, Mass. Mr. Knox has located in Indianapolis.

TRADE INFORMATION EXCHANGE BUSINESS PROPOSITIONS.

Opportunities Are Offered Below for Agents to Secure New Lines, for Manufacturers to Extend Their Representation, and for Producers to Get in Touch with Those Who Are in the Market for Equipment and Supplies. All Are Opportunities for Live Men and Firms Seeking Profitable Relations.

The Following Details of Trade Opportunities Presented by Members of the Trade Information Exchange Are Published Without Names, Those Interested Desiring the Negotiations to Be Strictly Confidential. Replies Should Be Addressed by the Number Given and Sent to the Exchange with Postage for forwarding.

EQUIPMENT NEEDED.

6123—California Concern, about to erect new garage, desires information relative to machine tools.

2376—Minnesota Firm, under new management, is interested in all kinds of garage and repair shop equipment.

4731—New York Company, operating first class garage, wants equipment for repair shop and garage, including machine tools.

8556—New York Firm, with large establishment, finely situated and doing capacity business, desires shop equipment for repair shop and garage, including machine tools and supplies.

4926—Kansas House, which has purchased new business, seeks information relative to machine tools and equipment for garage and repair shop.

9101—Iowa Company, doing business on large scale, is interested in all kinds of equipment for garage and repair shop. Machine tools are also sought.

9613—Colorado Concern, occupying new quarters, wants machine tools and garage equipment.

3404—Ohio Firm, completing fine two-story automobile building, is in the market for garage equipment and supplies; also repair shop equipment of all kinds.

7840—New York House, which has leased new building, desires information of garage equipment, machine tools and repair shop supplies and equipment.

7629—Kansas Concern, doing good business, is interested in garage equipment and supplies and repair shop supplies.

3943—Canadian Firm, engaged in the manufacturing business, is in the market for machine tools of first class make and durability.

7467—California Company, having modern plant and good business, seeks information relative to machine tools and garage and repair shop supplies.

5826—Iowa Firm, recently established in business, is in the market for all kinds of machine tools, and equipment and supplies for garage and repair shop.

7352—Illinois Concern, doing business in all branches of the automobile industry, wants information concerning equipment of every description for garage and repair shop and supplies for same.

5914—Pennsylvania Company is interested in garage equipment and supplies of various kinds.

7193—New Jersey House, enjoying increased business, is in the market for welding apparatus for repair shop and for garage supplies and equipment of every description.

CAR AGENCIES DESIRED.

7091—New York State Garage, recently opened with first class repair shop, in good location on main thoroughfare, would like agency for pleasure cars selling at $500 to $1000.

5293—New York City Concern, extending its business outside of the city, has an option on a desirable garage and is seeking the exclusive rights in Westchester county and adjacent territory that may be open, for two cars, one to sell for about $500 and one from $1200 to $1500.

4003—California Firm, which has opened a new automobile supply house, is also interested in the agencies for pleasure and commercial cars.

6496—Pennsylvania House, recently established with a good line of cars, is desirous of adding a good pleasure vehicle selling between $1425 and $1850.

9371—New Jersey Company, in thriving condition and making additions to its plant, is seeking a line of commercial motor vehicles selling from $800 to $3000; also will take agency for motor fire fighting apparatus selling up to $10,000.

1459—Pennsylvania State Concern, recently changed hands, will take agency for pleasure cars listing from $800 to $1700.

3011—Illinois Firm, formed to conduct automobile agency, supply business and garage, is interested in the agencies for pleasure cars listing from the lowest figure to $3500, and motor trucks listing from a low figure to $2000.

9693—Iowa Electric Concern, formed to handle a standard vehicle, will take agency for electric pleasure cars listing from $1500 to $3500 and electric motor trucks from $1000 to $5000.

7754—Massachusetts Firm desires either a Boston or New England agency for a gasoline pleasure car selling from $500 to $3000; also gasoline motor trucks listing as high as $3500.

ACCESSORY AGENCIES.

6477—Connecticut Concern, which is erecting a new service station, is interested in a complete line of accessories and supplies for pleasure and commercial vehicles.

5087—Pennsylvania Firm, recently changed hands, would take the agencies for good line of automobile accessories and supplies. Also is interested in garage supplies.

5218—Michigan Company, handling service business for five manufacturing concerns making various models of cars, for which it has secured exclusive rights, is interested in the agencies for first class line of garage and automobile supplies and accessories.

4619—Minnesota House, occupying a new garage, is interested in all kinds of garage and repair shop supplies.

1465—Texas Automobile Company, erecting new quarters, in which will be maintained an exclusive accessories department, would take agency for all kinds of accessories and supplies.

3554—California Firm, which has opened a supply house for the trade, is in the market for agencies for first class supplies and accessories, also garage and repair shop supplies.

9103—New York Concern, recently incorporated, is desirous of taking agency for accessories and supplies for steam power wagons.

4966—Pennsylvania Company, recently formed to handle standard make of car, is interested in all kinds of automobile accessories and supplies.

3719—New Jersey Firm, expanding its business, is desirous of securing garage and repair shop supplies, also supplies and accessories of every description for pleasure and commercial vehicles.

4340—Ohio Garage Company desires agency for automobile supplies and accessories and garage supplies.

SPECIAL OPPORTUNITIES.

3261—Long Island Garage Concern, forced to give up business because of a disastrous fire, has large quantity of all kinds of equipment for sale. Plant thoroughly equipped throughout with most modern machinery for all descriptions of repairing and rebuilding. Included in the list of articles to be disposed of is large line of supplies.

3972—Pennsylvania Concern, dealing exclusively in second hand machines, which are rebuilt for the market, announces its readiness to purchase second-hand cars of all makes from dealers anywhere for cash. The concern is building a large addition to its plant.

7827—Holland Company, which handles automobiles and automobile accessories and materials in the Netherlands, is desirous of hearing from American manufacturers of electric pleasure cars, with a view of taking the agency of their cars in Holland. This firm will bear investigation and has American references always at disposal.

2883—Massachusetts Man, who wishes to purchase a vehicle suitable for use in the automobile livery business and also for passenger use, would like to hear from the manufacturers of such vehicles.

12,000

Guaranteed Trade Circulation

ALL TRADE **NO OWNERS**

The Accessory and Garage Journal is the only strictly trade paper published in America that is devoted to the automobile and allied industries.

100 Per Cent. Trade Distribution 100 Per Cent.

Advertisers can use straight trade talk copy in every issue of the Accessory and Garage Journal—can make their trade proposition—can give their trade discounts—can get down to brass tacks in their advertising.

Advertisers cannot do this in any other medium—cannot use straight trade talk in an owner's magazine—cannot secure effective trade results from prints with part owner and part trade distribution.

The Accessory and Garage Journal reaches 12,000 trade interests each month.

A FEW COST FIGURES

THE ACCESSORY and GARAGE JOURNAL

1 Page, One Time, $60 1 Page, 12 Times, $50 Per Page--$600

12,000 Guaranteed Trade Distribution

MAGAZINES WITH PART TRADE AND PART OWNER DISTRIBUTION MUST ALL BE USED TO REACH THE WHOLE TRADE

One Page, 12 Magazines, average $80 per page, $960, against $60 in The Accessory and Garage Journal, the same service.

One Page, 12 Magazines, average $65, 12 times at $65 per page, $780, against $50 in the Accessory and Garage Journal, the same service.

Saving one month, $900, at one time rate.

Saving 12 months, on basis of one year, at 12 time rate, $8,760

Service is necessary and what must be paid for. The Accessory and Garage Journal gives this service, and it is the one medium to use to reach the trade.

Moderate rates permit all interests to be represented and this magazine is as valuable to the small producer as the largest manufacturer in the industry.

The mailing list of the Accessory and Garage Journal is the most authentic compilation of trade names in existence. Use this list and save fully 90 per cent. of all mailing list costs.

Detailed information at request. Next issue mailed April 15th.

THE AUTOMOBILE JOURNAL PUBLISHING CO.

Times Building - - PAWTUCKET, R. I.

To Truck Salesmen!

MOTOR TRUCK'S Editor Says:

"Business Men Want Facts"

Is His Suggestion An Idea For You?

MOTOR TRUCK

Is the Recognized National Authority on Highway Transportation and Haulage Economy.

Devoted to Specialized Information for the Business Man and Reflecting the Experiences of Business Men, Its Contents Are Equally Valuable to the Industry, the Distributor and the Selling Agent.

Those Who Sell Power Vehicles Must Meet and Understand the Problems of Business Men. They Must Know Not Only the Qualities of the Machines They Sell, but the Methods by Which They May Be Used to Yield the Fullest Measure of Economy.

The Quality of Distribution of the MOTOR TRUCK Is at Parity with the Character of Its Contents. It Is the Certain and Dependable Source of the Best Information That Experts Can Compile. Its Entire Value Is the Accuracy of the Facts Reflected in Its Articles.

Its Quality Is Based Entirely on the Dependence Placed in It by Its Readers. Its Quality Is the Influence It Has with Its Readers. Specialization Necessarily Limits Distribution, but It Absolutely Establishes Its Quality.

The Business Men of Today Are Investigating and Studying Haulage Economy. Those Who Sell Power Vehicles, Equipment, Supplies and Service Must Meet Their Demands. They Can Await Experience, or They Can Inform Themselves.

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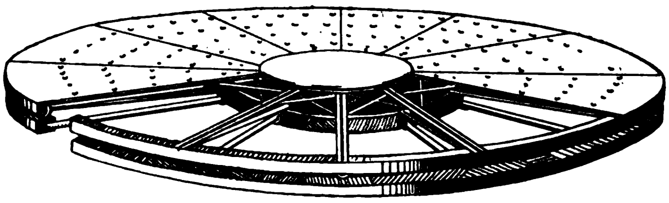

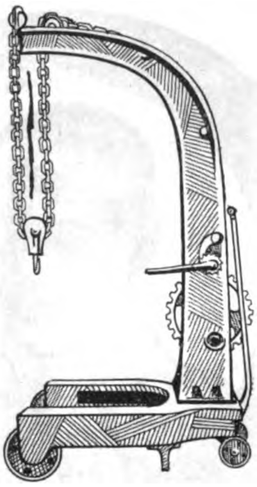

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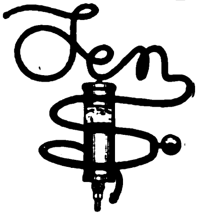

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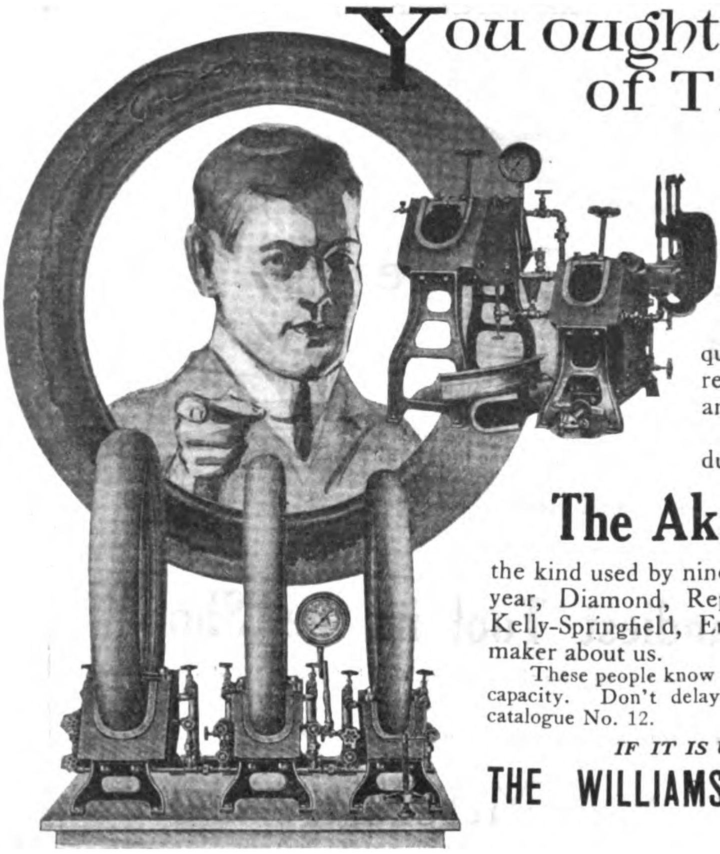

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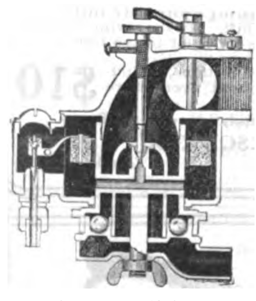

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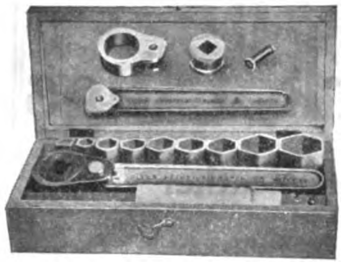

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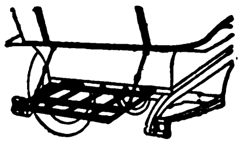

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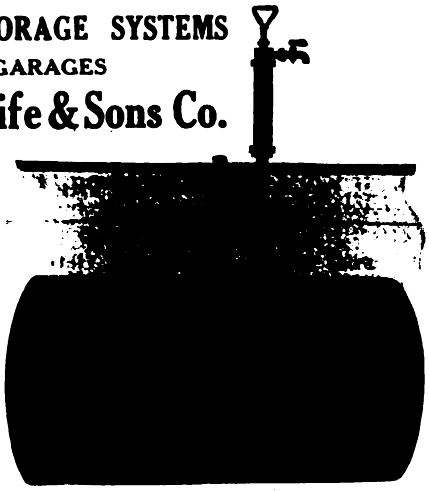

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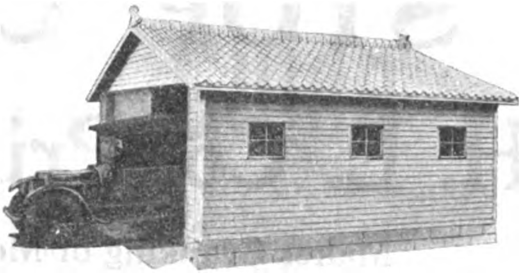

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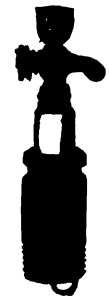

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Buyers Use This Guide

Representative houses in all branches of the industry are to be found in this index. When purchasing look for names, addresses and product wanted, under proper classified heading

ACCESSORY MANUFACTURERS AND JOBBERS.

Hawthorne Mfg. Co., 29 Spruce St., Bridgeport, Conn.

Hopewell Brothers, Newton, Mass.
Branch: 1974 Broadway at 67th St., New York.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

Miller, Chas. E., 97-103 Reade St., New York.
Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 250 Peachtree Street, Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Shaler Co., C. A., Waupun, Wis.

Waite Auto Supply Co., 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

AIR COMPRESSORS AND TANKS.

Williams Foundry & Machine Co., Akron, O.

AUTOMOBILES. (See Cars.)

AUTOMOBILE SPECIALTIES.

Sumner, George, Inc., 1926 Broadway, New York.

BALLS AND BALL BEARINGS.

Boyd, F. Shirley, 903 Boylston St., Boston. (R. I. V.)

Bretz Co., J. S., 250 W. 54th St., New York. (F. & S.)

Marburg Bros., Inc., 1790 Broadway, New York. (S. R. O.)

New Departure Mfg. Co., Bristol, Conn. (New Departure.)

R. I. V. Co., 1771 Broadway, New York. (R. I. V.)

BATTERIES.

Electric Storage Battery Co., Philadelphia. (Exide.)

Geissler Bros. Storage Battery Co., 514 W. 57th St., New York.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M.)

Waite Auto Supply Co., 81 Exchange place, Providence. (Success.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (LBA.)
Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 248 Monadnock Bldg., San Francisco.

BATTERY EXTINGUISHERS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

BLOW-OUT PATCHES. (See Patches.)

BODIES, TRUCK.

Lynch Manufacturing Co., Hammond, Ind.
Branches: East Chicago, Ind.; South Chicago, Ill.

Motor Truck Body Co., 320 Franklin St., Detroit.

BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multibestos.)
Branches: 903 Boylston St., Boston; 276 Canal St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

CABLES. (See Wires.)

CARBURETORS.

Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)

Sumner, George, Inc., 1926 Broadway, New York. (S. U.)

CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

CARS—GASOLINE PLEASURE.

Abbott Motor Co., 141 Waterloo St., Detroit. (Abbott-Detroit.)

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Buckeye Manufacturing Co., Anderson, Ind. (Lambert.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Croxton Motor Car Co., Washington, Penn. (Croxton.)

Cutting Motor Car Co., Jackson, Mich. (Cutting.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Car Co., Indianapolis. (Henderson.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Ideal Motor Car Co., Indianapolis. (Stutz.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Lenox Motor Car Co., Inc., Boston. (Lenox.)
Branches: New York, Boston, Chicago.

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Peerless Motor Car Co., Cleveland. (Peerless.)

Branches: 660 Beacon St., Boston; Broadway and 57th St., New York; Michigan Ave. and 25th St., Chicago.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Selden Motor Vehicle Co., Rochester, N. Y. (Selden.)

Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)

Studebaker Corporation, Detroit. (Studebaker.)

Warren Motor Car Co., Detroit. (Warren-Detroit.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)

Available Truck Co., 2884 Hamilton Ct., Chicago. (Available.)

Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Clark, E. S., 242 Freeport St., Dorchester Dist., Boston. (Clark.)

Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)

Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)

Grand Rapids Motor Truck Co., North St., Grand Rapids, Mich. (Hoosier Limited.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Co., Indianapolis. (Mais.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Peerless Motor Car Co., Cleveland. (Peerless.)
Branches: See Cars—Gasoline Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)

Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)
Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)
Branches: See Cars—Gasoline Commercial.

General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

BUYERS' GUIDE---Continued

Branches: See Cars—Electric Commercial.
Knox Automobile Co., Springfield, Mass. (Knox.)

White Co., The, 828 E. 79th St., Cleveland. (White.)
Branches: See Cars—Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CATALOGUE SYSTEMS.

Catalogue Systems Co., Fisher Bldg., Chicago, Ill.

CEMENTS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York. (Weed.)

CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 908 Boylston St., Boston. (Baldwin.)

Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)
Branches: See Accessory Manufacturers and Jobbers.)

CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.
Chelsea Clock Co., 16 State St., Boston.

CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

COILS.

Heinze Electric Co., Lowell, Mass.

CONTROLLERS AND ECONOMIZERS.

Moller Brothers Controller & Economizer Co., 700 Betz Bldg., Philadelphia. (M. & M.)

CUSHIONS.

Leavens & Co., Wm., 32 Canal St., Boston. (Leavens Shock Absorbing.)

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

FIRE EXTINGUISHERS.

Pyrene Co. of New England, 176 Federal St., Boston. (Pyrene.)

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASKETS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vellumoid.)

GAUGES.

Goodnow Manufacturing Co., 754 Old South Bldg., Boston. (Gasoline Gallon.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)
Branches: In all principal cities.

GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

GUNS, GREASE. (See Oil Pumps.)

HEADLIGHTS.

Sumner, George, Inc., 1926 Broadway, New York City. (Diva.)

HORNS.

Dean Electric Co., Elyria, O. (Tuto.)

Randall-Faichney Co., Boston. (Jericho, Jubilee.)
Branch: 918 Eighth Ave., New York.

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

LAMPS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol.)

LICENSE NUMBER BRACKETS.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Aplco.)
Dean Electric Co., Elyria, O. (Dynalux.)
Geissler Bros. Storage Battery Co., 514-520 W. 57th St., New York.
Remy Electric Co., Anderson, Ind. (Remy.)

LOCK SWITCHES. (See Switches.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagleine No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)
Branch: 143 No. Wabash Ave., Chicago.

Haws, Geo. A., 77 Pine St., New York. (Panhard.)
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.
Refineries: Georgetown, Ky.; Lawrenceville, Ill.

Invader Oil Co., 80 Broad St., New York. (Invader.)
Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)
Branches: See Accessory Manufacturers and Jobbers.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Standard Oil Co., New York. (Polarine.)
Branches: In all cities.

Texas Company, The, 7 West St., New York.
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.

Bretz Co., J. S., 250 W. 54th St., New York. (U. & H.)

Marburg Bros., 1790 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; 180-182 Massachusetts Ave., Boston; 1028 Geary St., San Francisco; 868 Woodward Ave., Detroit; 1228 S. Olive St., Los Angeles, Cal.; S. W. Corner Cherry and Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; 1628 Broadway, Seattle, Wash.; London, Eng.; Buenos Aires.

MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

MIXING DEVICES, GASOLINE.

Approved Auto Specialties Co., 1781-87 Broadway, New York. (Wolf.)

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

Emblem Manufacturing Co., Angola, N. Y. (Emblem.)
Branches: Los Angeles, San Francisco.

Hawthorne Manufacturing Co., 29 Spruce St., Bridgeport, Conn. (Old Sol Lamps.)

Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

Swenson, E. A., 522 Broad St., Cor. Blackstone St., Providence. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me.

MOTORS AND POWER PLANTS.

Continental Motor Mfg. Co., Detroit. (Continental.)

Rutenber Motor Co., Marion, Ind. (Rutenber.)

PACKING, FIRE

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

PAINT, ANTI-RUST.

Anti-Rust Paint Co., Dept. 7, Akron, O. (Thomas.)

PATCHES.

Invincible Puncture Proof Tire Co., 53 Sabin St., Providence. (Invincible.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

POLISH.

International Metal Polish Co., Quill St. and Belt R. R., Indianapolis, Ind. (Blue Ribbon.)

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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Branches: See Horns.

PUMPS, TIRE.

Brown Co., Syracuse, N. Y. (Brown Impulse.)

Dewey-Anderson Co., Toledo, O. (Dewey Power.)

Hawthorne Manufacturing Co., Inc., 29 Spruce St., Bridgeport, Conn. (Hawthorne.)

RADIATOR CONNECTORS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 908 Boylston St., Boston. (Dorian.)

Firestone Tire & Rubber Co., Akron, O.
Branches: In all principal cities.

United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)
Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)

BUYERS' GUIDE---Continued

Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

National Gas Engine Starter Co., 80-82 N. Dearborn St., Chicago. (National.)

Willard Storage Battery Co., 5716 Euclid Ave., Cleveland. (LBA.)
Branches: See Batteries.

SHIELDS, MOTOR.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 908 Boylston St., Boston.

"J-M" Shock Absorber Co., 210 So. 17th St., Philadelphia. ("J-M.")
Branches: 218 W. 84th St., New York; 222 Elliot St., Boston; Teck Building, Buffalo; 10 W. Eager St., Baltimore; 41 Dexter St., Pawtucket, R. I.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

Sumner, George, Inc., 1926 Broadway, New York. (Velvet Auxiliary.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.)
Branch: 1974 Broadway, New York.

SOLDERS.

Simplex Aluminum Solder Co., 108 Broadway, Long Island City, N. Y. (Simplex.)

SPARK PLUGS AND IGNITERS.

American Ignition Co., 319 Adams St., Dorchester, Mass. (Amico.)

Bosch Magneto Co., 223-225 W. 46th St., New York.
Branches: See Magnetos and Magneto Supplies.

Frontier Specialty Co., 734 Main St., Buffalo. (All-in-One.)

Heinze Electric Co., Lowell, Mass. (H. E. Co. Priming.)

Janney, Steinmetz & Co., Philadelphia.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)

Randall-Faichney Co., Boston. (Mac-Kae.)
Branches: See Horns.

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.
Branches: See Magnetos and Magneto Supplies.

Standard Co., The, Torrington, Conn. (Black Eagle.)

SPARK PLUG TERMINALS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

Randall-Faichney Co., Boston. (Mac-Kae Blitz.)
Branches: See Horns.

SPEEDOMETERS.

Hoffecker Co., The, Motor Mart, Boston. (Hoffecker.)

Jones Speedometer, New Rochelle, N. Y.
Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1618 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

SPRINGS FOR AUTOMOBILE SUSPENSION.

Marburg Bros., Inc., 1790 Broadway, New York. (Marburg-Hagen.)

Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

Sumner, George, Inc., 1796 Broadway, New York City. (Acme.)

SPROCKETS.

Boyd, F. Shirley, 908 Boylston St., Boston. (Baldwin.)

STEEL PARTS, SEAMLESS.

Standard Welding Co., Cleveland.

STORAGE SYSTEMS—GASOLINE AND OIL.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

SWITCHES, LOCK.

Blackburn Specialty Co., 1120 Prospect Ave., S. E., Cleveland. (Autolock.)

TANKS, ACETYLENE GAS.

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)
Branches: See Cylinder Cleaning Compound.

TANKS FOR FUEL AND WATER.

Janney, Steinmetz & Co., Philadelphia.

Scaife & Sons Co., Wm. B., Pittsburg, Penn.
Branch: New York City.

TANKS, TIRE INFLATING.

Prest-O-Lite Co., 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)
Branches: See Cylinder Cleaning Compound.

TAPE, ASBESTOS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

THERMOS CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

TIRE ACCESSORIES.

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Shaler Co., C. A., Waupun, Wis.

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)
Branch: 1974 Broadway, New York.

TIRE CHAIN GRIPS. (See Chains.)

TIRE PRESERVATIVES AND PROTECTORS.

Approved Auto Specialties Co., 1781-87 Broadway, New York. (Goodman Tire Shield.)

Gray Specialty Co., 148 Avon Ave., Newark, N. J.

National Rubber Co., 4483 Papin St., St. Louis, Mo. (Tirenew.)

Page-Lester Co. 2644 Indiana Ave., Chicago. (Tite-Wad Rubber Putty.)

TIRE REMOVERS.

O-Tak-A Tire Remover, Le Roy, N. Y.

TIRES—CASINGS AND INNER TUBES.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)
Branches: 811-818 Boylston St., Boston; 17½ Dorrance St., Providence.

Frontier Tire & Rubber Co., 1054 Main St., Buffalo, N. Y. (Frontier.)

Gaulois Tire Co., 1926 Broadway, New York. (Gaulois.)

Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)
Branches: In all principal cities.

Hood Rubber Co., Watertown, Mass. (Shawmut.)

United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)
Branches: See Rims—Removable and Detachable.

Walpole Tire & Rubber Co., Walpole, Mass. (Walpole.)

TIRES—CUSHION.

Cataract Rubber Co., Wooster, O. (Cataract.)
Branches: Boston, New York, Providence.

Firestone Tire & Rubber Co., Akron, O. (Firestone.)
Branches: See Rims—Removable and Detachable.

Motz Tire & Rubber Co., The, Akron, O. (Electric Special Motz Cushion.)
Branches: Boston, New York, Philadelphia, Pittsburg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright. G & J.)
Branches: See Rims—Removable and Detachable.

TIRES—SOLID AND COMMERCIAL.

Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O.
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass.
Branches: See Tires—Casings and Inner Tubes.

Motz Tire & Rubber Co., The, Akron, O. (Motz.)
Branches: See Tires—Cushion.

Polack Tyre and Rubber Co., 246 W. 59th St., New York City. (Polack.)

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York.
Branches: See Rims—Removable and Detachable.

TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)
Branch: 1974 Broadway, New York.

TRUCKS AND TRACTORS—See Cars, Commercial.

TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

TUBING, GAS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

TURNTABLES.

Beach Co., T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

UNIVERSAL JOINTS.

Bretz Co., J. S., 520 W. 54th St., New York. (Hartford.)

Kinsler-Bennett Co., The, P. O. Box 124, Hartford, Conn. (Kant-Break.)

VALVE GRINDERS.

Wall, J. H., 290 Hope St., Bristol, R. I. (Ford.)

VULCANIZERS.

McVey Manufacturing Co., Third and Canal Sts., Dayton, O. (McVey.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Garage and Individual.)
Branches: In all principal cities.

Shaler Co., C. A., Waupun, Wis. (Shaler.)

Vanderpool Co., Springfield, O.

Williams Foundry & Machine Co., Akron, O.

WELDING OUTFITS.

Prest-O-Lite Co. 809 W. South St., Indianapolis. (Prest-O-Welder.)
Branches: See Cylinder Cleaning Compound.

WELDING, STEEL.

Standard Welding Co., Cleveland.

WHEELS.

Eberly & Orris Mfg. Co., Mechanicsburg, Penn.

WIRES AND CABLES.

Diamond Rubber Co., of N. Y., Akron, O. (Diamond.)

WIRE MECHANISM.

Bretz Co., J. S., 250 W. 54th St., New York. (Bowden.)

WRENCHES AND COMBINATION OUTFITS.

Allen Wrench and Tool Co., Providence, R. I. (Allen Friction Socket Sets.)

Coes Wrench Co., Worcester, Mass.

Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

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THE ACCESSORY
—AND—
GARAGE JOURNAL

Devoted Exclusively to the Automobile Trade and Allied Interests

VOL. II. PAWTUCKET, R. I., APRIL, 1913. No. 12

NO SERIOUS DAMAGE BY FLOODS.

Automobile Industry Escapes Severe Losses and Concerns Affected Recover Rapidly---Dealers Worst Sufferers---Latest News from Ohio and Indiana.

FORTUNATELY, beyond a temporary delay, due more largely to the inability of railroads to offer shipping facilities than to conditions in the factories themselves, the automobile industry has experienced no serious damage as a result of the recent floods in Ohio and Indiana. Dealers lost more heavily than manufacturers, many of them being located in the down-town business districts of the cities and towns reached by the water, and of course, many owners were affected, since thousands of people had all their personal effects destroyed. This latter condition applies as well as a result of the tornado which visited Omaha, Neb., a few days previous to the floods in other sections.

In both emergencies, pleasure and commercial automobiles were impressed into service to aid in the work of rescue and rehabilitation. In many instances these were able to demonstrate their practicability in a thoroughly effective manner, long after other means of transportation were entirely cut off.

While it is impossible to estimate the amount of damage to dealers, the latest reports from the stricken districts are most optimistic for the future. The effect upon the manufacturers is set forth briefly below, it being taken for granted that those not mentioned escaped all loss. So far as the dealers are concerned the situation in Dayton, O., in which these men suffered most largely, is best set forth by the following announcement in one of the salesroom windows: "Hurrah for Greater Dayton. Orders filled promptly here."

The Esterline Plant at Lafayette, Ind., as It Appeared When Under 18 Feet of Water.

Dayton, O.—Dayton Motor Car Company, subsidiary of Maxwell Motor Company; lower floors of three buildings flooded; reports $50,000 damage; delayed about two weeks. Speedwell Motor Car Company, Speedwell cars and trucks, undamaged; delayed through rescue work. Dayton Engineering Laboratories Company, Delco systems; 40 employees caught in flooded building; 12 feet of water in the basement; damage largely to building; not seriously delayed. Apple Electric Company, Aplco systems; machine shop and battery department flooded but no serious damage. American Tank & Pump Company, storage systems; factory badly flooded, but damage is considered comparatively slight.

Indianapolis, Ind.—Marion Motor Car Company, Marion cars; first floor submerged and second utilized as shelter for refugees; resumed in 10 days. Nordyke & Marmon Company, Marmon cars; plant partially submerged; finished stock, etc., out of harm's way; not seriously delayed. Motor Car Manufacturing Company, Pathfinder cars; first floor partially submerged; finished stock and materials moved to second floor before flood reached the building. R. J. Irvin & Co., bodies; slight damage.

Troy, O.—Troy Wagon Works Company, trailers for motor truck installations; considerable damage to factory proper, office badly flooded, records damaged; soon running normally. Troy Carriage Sun Shade Company, windshields; six feet of water; resumed work April 7.

Muncie, Ind.—Inter-State Automobile Company, Inter-State cars; delayed through lack of power. Muncie Gear Works, Muncie Auto Parts Company and Muncie Wheel Works, not seriously affected.

Peru, Ind.—Great Western Automobile Company,

Henderson Car on Its Way to Relieve Householders Just Before Breaking of Levee in West Indianapolis.

Great Western cars; five inches of water in factory; nominal loss. Peru Auto Parts Manufacturing Company; from one to two feet of water; slight damage. Brown Commercial Car Company, Brown trucks; plant under two feet of water; damage to stock very slight.

Anderson, Ind.—Remy Electric Company, Remy ignition; Buckeye Manufacturing Company, Lambert cars, trucks and farm tractors, and Nyberg Automobile Works, Nyberg cars and trucks; delayed through loss of power. No damage.

Akron, O.—Only concern to suffer was Goodyear Tire & Rubber Company; water entered basement of one building and put out fires; nominal loss.

Youngstown, O.—Republic Rubber Company, donated use of private water supply when city supply was shut off. No damage and no other delay.

Connersville, Ind.—Empire Automobile Company, branch of Indianapolis concern, Empire cars; delayed through shortage in coal supply. McFarlan Motor Car Company, McFarlan cars; no loss and only slight delay.

Middletown, O.—Miami Cycle & Manufacturing Company, Merkel motorcycles; factory undamaged; great loss of personal effects among workmen. Crescent Motor Truck Company, Crescent trucks; no damage; delayed but little.

Logansport, Ind.—Rutenber Motor Company, branch of plant in Marion, Ind., Rutenber motors; foundry flooded to average depth of three feet; deliveries made from Marion plant without delay.

Kokomo, Ind.—Apperson Bros. Automobile Company, Apperson cars; badly flooded.

Fort Wayne, Ind.—Ideal Auto Company, Ideal trucks; factory under four feet of water for 10 days; direct loss of materials not as great as at first anticipated. Wayne Oil Tank & Pump Company, storage systems; first floor flooded; several thousand dollars damage to machines, furniture and buildings. S. F. Bowser & Co., storage systems; only slight damage, factory shut down but four hours.

Lafayette, Ind.—Esterline Company, electric lighting and starting systems; factory badly flooded, but practically all material and much of the machinery was removed before the flood arrived; loss will not exceed $10,000. Ross Gear & Tool Company, steering gears; factory shut down for one week.

Hamilton, O.—Republic Motor Car Company, Republic cars; factory undamaged, although at first reported to have suffered serious loss.

Chillicothe, O.—Arbenz Car Company, Arbenz cars; factory partially flooded; deliveries will not be affected seriously.

Columbus, O.—Columbus Buggy Company; Firestone-Columbus and Columbus electric cars; plant flooded to depth of 10 inches, but did not reach electric car department or battery room.

THE NEW TARIFF BILL.

Rates on Automobiles Unchanged but Parts and Tires Are Considerably Reduced.

Coincident with the opening of the extraordinary session of Congress, April 7, the new Underwood tariff measure was introduced and its provisions made public. The automobile industry is very much interested in the effect this would have if the bill were to be enacted into law as presented. It is expected, of course, that numerous amendments will be made before the measure reaches President Wilson for his signature.

The new tariff bill is a voluminous document, and doubtless there are many articles utilized in the production of motor cars and their accessories which do not appear in the summary which has been prepared for more ready reference by those who may be interested. This summary shows that the rate on automobiles, as such, is unchanged, being the same as under the so-called Payne bill, 45 per cent. Automobile parts, excepting tires, however, are listed at 20 per cent. and chassis without bodies are placed at 30, instead of 45. Motorcycles also receive a cut of 5 per cent., the Underwood rate being 40 instead of 45. Aeroplanes are reduced from 45 per cent. to 25.

Schedule N provides for duties on manufactured articles from india rubber, gutta percha, etc., and shows a reduction on this item from 35 per cent. to 10. The item covering rivets, studs, steel points, brightened, and same for automobiles, in schedule C, bears a reduction from 45 per cent. to 20. Tungsten bearing ores are to be admitted free.

Among the articles entering into the manufacture of automobiles or fittings to be affected are: Mica and manufactures of, 10 cents a pound and

Cole Machine Engaged in Rescue Work in West Indianapolis, Indicating the Extent of the Flooded District.

20 per cent., to 30 per cent.; carbon electrodes, brushes and plates, 30 per cent. to 25; lava burner tips, 10 cents a gross and 15 per cent., to 15 per cent.; oils and greases not otherwise provided for, 25 per cent. to 15; aluminum scrap and alloys, seven cents a pound to 25 per cent.; aluminum plates, sheets, bars and rods, 11 cents a pound to 25 per cent.; calcium carbide, 25 per cent to 10.

EXPERIMENTS WITH KEROSENE.

Chief Engineer of National Line Has Been Making Exhaustive Fuel Tests.

Among the many motor car manufacturers making experiments with kerosene as fuel is the National Motor Vehicle Company, Indianapolis, Ind., maker of National cars. Chief Engineer William G. Wall has been supervising exhaustive tests for a number of months, and is quoted as saying that in his opinion it will be only a short time before a majority of automobiles will use kerosene instead of gasoline.

Although Mr. Wall holds that there is some question as to the feasibility of starting on kerosene direct and suggests that it may be necessary to use a little gasoline for this purpose, he believes that the electric motor starter will aid greatly in solving the problem. He adds that the disadvantages of the heavier fuel in winter are not too serious to be overcome easily; in fact, he claims to have accomplished this result in his winter experimenting at the National factory.

MOTORISTS WIN VICTORY.

Troublesome Clause in Michigan Statute Declared Unconstitutional by Supreme Court.

Motorists in Michigan have won a signal victory in the recent decision of the supreme court in the case of Nina L. Dougherty vs. William S. Thomas, in which a clause of the automobile law of 1909 is found to be unconstitutional. Under this act the owner, not the driver, could be held responsible, and the suit in question was brought as the result of an accident which occurred when a garage employee was delivering a machine to its owner. The clause which has been declared unconstitutional, reads as follows:

> The owner of a motor vehicle shall be liable for any injury occasioned by the negligent operation by any person of such motor vehicle, whether such negligence consists in violations of the provisions of the statute of this state or in the failure to observe such ordinary care in such operation as the rules of the common law require, but such owner shall not be liable in case such motor vehicle has been stolen.

Justice Stone in commenting upon this section of the law said:

> To hold sub-division 3 of section 10 constitutional is to hold a party absolutely liable for the negligent conduct of another, a mere stranger or a willful trespasser, no matter how careful or how free from negligence he himself has been. We think that the result of such a holding would be to take the property of defendant, Thomas, to pay for the wrongful and negligent act of another person, not sustaining to him the relation of servant, agent or employee.
>
> Such a doctrine seems unnatural and repugnant to the provisions of the constitution here invoked. We are forced to the conclusion that the provisions of this sub-division are not a necessary regulation in the exercise of the police power; that in and by its terms the plain provisions of the constitution are violated and the sub-division must be held unconstitutional, and the statutory liability therein asserted done away with.

CATARACT TIRE POLICY.

Careful Study of Production Problem Results in Improved Manufacturing Methods.

In view of the rapid development of the automobile industry, it is not surprising that it has taken much time and experimentation to produce equipment that may be regarded as perfected in every respect. This applies particularly to the matter of tires, which have been considered by many motorists as presenting the chief source of expense in the operation of a car. Tire manufacturers have realized this and have devoted a large amount of effort in solving some of the peculiar problems arising in this field. William J. B. Hackett, sales manager of the Cataract Rubber Company, with main office at Boston, factory at Wooster, O., and branches in a number of the larger cities, calls attention to some of the improvements in manufacture adopted by his concern, which should prove of decided interest to the owner. Mr. Hackett calls special attention to the composition of the product as well as the methods used in curing, etc. He writes as follows:

William J. B. Hackett, Sales Manager, Cataract Rubber Company.

> The Cataract Rubber Company is using the highest grade of longest staple Sea Island cotton fabric produced in this country, and under several tests on a fabric testing machine it shows a minimum breaking strength of 430 pounds. Coupled with this fact, the weave is such that the rubber friction adheres to the minute perforations with a grip obtainable in no other way. We use more rubber between our fabric, resulting in more resiliency and prolonging the life of the tire where the strain is the greatest.
>
> The system of mold equipment used by our concern produces a real live steam cured tire, as the mold ring extends about one-third of the way above the bead, exposing the entire tread surface to the steam. This also eliminates all possibility of fabric troubles, such as mold pinching, separation of the plies and buckling of fabrics.
>
> In building up the tire it is carefully calipered at each stage of the construction. Therefore, when our final wrapping of the tread is completed we have a casing ready for insertion in the vulcanizer that is symmetrically perfect. As the mold rings in this system weigh about 40 pounds complete, all possibility of injury from weight during the curing process is avoided.
>
> The Cataract Rubber Company guarantees its casings for 4000 miles and issues a signed certificate with each. We are pleased to state, however, that we have hundreds of users averaging better than 5000 miles on such cars as the Pierce-Arrow, Lozier, Simplex and Alco.
>
> Our company is producing two types of inner tubes.

One is a heavy, substantial red tube with a larger percentage of pure gum than usual. This is what we call the "come back." That is, it assumes its natural size after it has been inflated a month or two. We recommend this tube for high powered cars doing severe duty. The Cataract gray tube comprises what is known as a floating stock gum tube, having 90 per cent. of pure gum and making for resiliency and long life. It is our experience that this type outwears three casings.

Beginning with 50 tires a day the company will reach an output of 100 shortly, and it will not surprise the writer to see this increased to 500 a day within a year. In connection with our pneumatic production, we have, in the Cataract diagonal block truck tire, the solution most needed from the standpoint of economy and service in commercial vehicles. These are guaranteed for 10,000 miles and have shown over 12,000 miles on a three-ton Packard rear wheel. The truck is owned by the Adams Express Company and operated in New York City.

GOODYEAR GETS CONCESSION.

Ohio Tire Concern to Erect Large Factory at Rio de Janeiro, Brazil.

According to a recent announcement made in New York City, the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, has entered into an agreement with the government of Brazil for the erection of a factory for the production of rubber articles in that country. The move is understood to be in accordance with an act passed by the Brazilian congress some time ago, under which the President was authorized to grant exceptional favors to the first concern to locate a plant of this character in Rio de Janeiro. These included a cash award of about $167,000, the right to expropriate land upon which to erect the factory, and exemption of all customs duties on chemicals and products used as compounding ingredients and fabrics of all sorts, as well as municipal, state and federal taxes.

Proposals were received after specific regulations defining the real intention and purpose of every clause bearing on these concessions were prepared by the minister of agriculture and commerce, and a committee was appointed to pass upon them. It appears from the report that the proposition presented by the Goodyear company was most acceptable.

TESTING MIXED FUELS.

Several Interesting Experiments Have Been Made by Concerns in England.

At least two of the omnibus companies in London are operating cars with mixed fuel. The British Motor Cab Company is using a mixture of 40 per cent. kerosene and 60 per cent. gasoline, while the London General Omnibus Company utilizes a mixture of benzol and kerosene. The former concern says that the only alterations to the carburetor found to be necessary are a slight increase in the size of the jet and an enlargement of the air inlet somewhat. An auxiliary attachment on the dash permits of using gasoline for starting.

Southern Automobiles, Ltd., Blackheath, London, has been testing a mixture of one-third benzol and two-thirds kerosene with very satisfactory results, as indicated by the following report:

> The car on which we conducted this experiment is a 14 horsepower Germain, now seven years old. The engine, although it is in fairly good condition, ought to have new pistons fitted. We have been using the mixture in an ordinary S. U. carburetor without any special vaporizer. We have, however, taken precautions to see that the whole of the jacketing on the carburetor is kept extremely warm, and the long induction pipe which is fitted to this type of car is so arranged as to be well and efficiently warmed.
>
> The only difficulty we have experienced is in starting, and we have found that when the car has been left standing overnight the benzol appeared to separate somewhat from the kerosene. We found we could get over the difficulty by fitting a tap so arranged as to draw a small quantity of benzol from the top of the tank for starting purposes, and after the car has been running, to change the supply over to draw from the lower portion of the tank, as the vibration of running is sufficient to keep the fuel mixed.
>
> With regard to carbon deposit we have never experienced any difficulty in this direction, either with benzol only or the mixture of benzol and kerosene, except in cases where the carburetor was obviously at fault. The normal amount of deposit has proved to be not more than when gasoline has been used.
>
> We have during the last few days been experimenting with a still cruder fuel in the shape of a by-product obtained in the production of naphthaline; this we find mixes with benzol in equal proportions and works quite satisfactorily.

In this connection it is interesting to note that a company has been formed in Brussels for the production and introduction of a new motor fuel, known as La Perosine. This is described as consisting of "petroleum free from excess of carbon and constituents detrimental to its combustion." It is held to give off no smoke or deposit, and to require no modification of the carburetor.

SOUTHERN TIRE PLANT.

Seminole Rubber Company Selects Jacksonville, Fla., Because of Shipping Facilities.

According to plans which the incorporators state are practically completed, Jacksonville, Fla., will have a big industrial plant, employing 500 persons and producing 300 automobile tires a day, together with other automobile accessories in which rubber is used, to be known as the Seminole Rubber Company, a concern with $1,000,000 capital. The company is the first rubber manufacturing firm to be located in the South and the plans provide for the construction of a large building and the actual operation of the plant within 90 days.

George F. Hardy, George H. Lutz and J. J. Weyer are named in the application for charter as the incorporators. The principal inducements that attracted the new concern to Jacksonville are stated to be the immense field in the South for its product, the city's unequalled advantage as a port of entry for the crude rubber from South America and the shipping of the manufactured product by water, and proximity to the raw material from the cotton fields, especially the Sea Island product, which is used extensively in the manufacture of automobile tires.

Since the announcement that the Speedwell Motor Car Company, Dayton, O., would give an option of its new rotary valve or a poppet valve motor in its 1913 Speedwell cars, orders have been received which necessitate the operation of the factory with day and night shifts.

NEWS NOTES OF THE INDUSTRY

RECENT INCORPORATIONS.

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, etc.:

Westcott Motors Company, Boston; $3000; Orris W. Nelson, Harvey L. Kemp, George H. Learned.

Consumers Auto League, Boston; $50,000; Guy A. Ham, Harry H. Ham, Ralph H. Willard.

Puncture Cure Company, Chicago; $1000; to make and deal in automobiles, tires and supplies; Abraham Frank, William Church, Charles C. Johnson.

Rochester Automobile Exchange, Rochester, N. Y.; $500; Bertram Wilson, W. Hayes Mitchell, Owen D. DeWitt.

Petersen Motor Car & Garage Company, Chicago; $5000; Monroe T. Petersen, Nels H. Linquist, William D. Petzel.

Whitehouse-Le Compte Manufacturing Company, Newark, N. J.; $200,000; to deal in hardware, automobiles. etc.; H. G. Whitehouse, E. A. Whitehouse, F. W. Ehrlich.

Knox-Wyland Motor Car Company, Pittsburg, Penn.; $2000; O. E. Knox, W. J. Wyland, W. A. McCoy.

The Automobile Owners' & Drivers' Protective Association, Minneapolis, Minn.; $50,000; W. H. Seitzler, Richard Footman, E. G. C. Montgomery.

New York Simplex Auto School Company, South Orange, N. J.; $25,000; correspondence school, T. Preston Ward, Harry L. Smith, Richard W. Hollaman.

Montauk Motor Company of Brooklyn, Brooklyn, N. Y.; $10,000; Louis F. Ohse, James K. B. Webber, Morton Foster.

Park Garage of Victoria, Victoria, Tex.; $10,000; John Frazer, J. T. Linebaugh, W. H. Crain.

Macon Auto Company, Macon, Ga.; $6000; C. F. Calhoun, J. P. Stubbs, W. E. Henry.

Griffith Auto Company, Savannah. Ga.; $10,000; C. M. Griffith, J. H. Brown.

Cumberland Motor Company, Pineville, Ky.; $50,000; N. J. Weller, A. W. Bryant, M. J. Moss, John A. Pitman.

Entz Automobile & Battery Company, $10.000; T. B. Entz, Alice von S. Entz, Kenneth S. Walker.

Hirsch Motor Car Company, Chattanooga, Tenn.; $5000; M. Hirsch, H. Hirsch, J. S. Hirsch, J. L. Levine.

Loeb Automobile Company, Memphis, Tenn.; $5000; Henry Loeb, E. F. Goldsmith, Charles W. Hirsch.

Blomberg Automobile Company, Memphis, Tenn.; $5000; Robert York, P. A. Gates, L. H. Wise.

Galveston Motor Car Company, Galveston, Tex.; $3000; R. Carter, Mrs. Lora Carter, G. G. Lescher.

Hunter Motor Company, Roanoke, Va.; $15,000; Joseph L. Hunter, T. D. Hunter, W. E. Hunter.

Robinson-Lewis Company, Jersey City, N. J.; $25,000; general automobile business, G. H. E. Robinson, R. V. O. Lewis, J. C. Delatush.

Gibson Motor Car Company, Pittsburg, Penn.; $3,000,000; C. E. Gibson, J. H. Mahoney, E. D. Johnson.

Automobile Leather Manufacturing Company, Newark, N. J.; $150,000; W. A. Smith, F. I. Ennis, T. G. Woodruff.

Auto Combination Manufacturing Company, Chicago; $50,000; to manufacture automobile supplies and equipment; H. M. Snow, G. W. Nevlue, W. J. Liddy.

Whitestone Garage, Inc., Whitestone, N. Y.; $5000; to make and sell machinery for generation of steam, electricity, etc.; John A. O'Fee, Herbert A. Trotman, Mary A. O'Fee.

Dayton Automobile Repairing Company, Inc., New York City; $5000; Charles E. Holste, Victor Drummond, Valentine E. Mott.

Kirkham Aeroplane & Motor Company, Inc., Savona, N. Y.; $100,000; Charles B. Kirkham, Stanley I. Vaughn, Edwin H. Skinner.

F. & P. Auto Transportation Company, Inc., Brooklyn, N. Y.; $70,000; William O. Goddard, Frank K. Fairchild, George A. Logan.

Divine Tire Company, Inc., Utica, N. Y.; $225,000; automobile tires; Charles W. Wicks, A. James Eckert, Bradford H. Divine.

Texas Motor Car & Truck Company, Austin, Tex.; $10,000; John C. Fink, A. A. Ritcheson, W. H. Folts.

Summit Auto Company, Akron, O.; $10,000; to deal in pleasure cars and trucks; E. J. Eblen, J. M. Lauder, F. L. Matz, Rachel Lauder, Almira Eblen.

Page-Lester Company, Springfield, Ill.; $2500; automobile accessories; Harry L. Page, M. F. Frisch, Anna Hess.

Desert Motor Truck Company, Salt Lake City, Utah; $50,000; Ira Cole, Domine Burns, J. E. Fleige.

Lawrenceville Auto Company, Lawrenceville, Ill.; $16,000; Fred B. Childress, Allen C. Stoltz, Nellie S. Childress.

Mitchell & Smith, Boston; $10,000; automobile supplies; F. Robins Mitchell, William E. Smith, Albert E. Smith.

Brady Murray Motors Corporation, New York City; $55,000; motors, trucks, cars and automobiles; Arthur T. Murray, Samuel L. Marcus, Charles Wein.

Commer Truck Company of America, New York City; $3,000,000; J. F. Curtin, H. O. Coughlan, J. M. Satterfield.

The Bedford Motor Bus Company, Bedford, Ind.; $10,000; M. Wallner, A. E. Smith, C. K. Brock.

Krit Motor Car Company of Michigan, Indianapolis, Ind.; $500,000; capital in Indiana, $5000; to sell and deal in automobiles; C. S. Briggs, W. S. Piggins, B. C. Laughlin.

Severin Tire & Supply Company, Oklahoma City, Okla.; $10,000; A. L. Severin, L. H. Severin, J. H. Eagan.

United Rubber Tire Company, Chicago; $1000; F. M. Hutchinson, W. W. Cole, Jr., A. W. Smith.

Central Motor Car Company, Altoona, Penn.; $10,000; C. C. Baker, Albert C. Akers, G. M. Smith.

W. M. Caldwell Company, Waltham, Mass.; $5000; to sell and repair automobiles; William M. Caldwell, F. Jordan, T. F. Carey.

Akron Tire & Rubber Company of Boston, Boston; $15,000; Abraham Palder, Max Laserson, C. Braunstein.

Central Motor Supply Company, Inc., Rochester, N. Y.; $30,000; electrical and mechanical devices; B. B. Barager, R. F. Close, W. Wood, C. W. Galliger.

Lindsay Auto Parts Company, Indianapolis, Ind.; $250,000; to take over manufacturing business of Thomas J. Lindsay and handle patents he holds; Mahlon E. Bash, Matt W. Lowder, Joseph T. Head.

Motor Truck Manufacturing Corporation, Mt. Vernon, N. Y.; $150,000; H. Hilchenbach, L. Bertsch, A. J. Albert.

Henry Tobin Company, Inc., New York City; $50,000; automobiles; Henry Tobin, Richard F. Tobin, Joseph B. McDonough.

Androscoggin Motor Company, Boston, and Lewiston, Me.; $10,000; George A. Pulsifer, William G. Renwick, Gilbert Hodges, Jr.

Cleveland Motor Trucking Company, Cleveland, O.; $10,000; Henry Eckhoff, C. B. Goetzfeld, G. A. Cochran, R. W. Blake, J. Charles Ross.

John Berry Automobile Company, St. Louis, Mo.; $20,000; to make, rebuild and repair automobiles; John Berry, Louis J. Koenigstein, Albert Bommer.

Peerless Radiator & Auto Lamp Works, Inc., Brooklyn, N. Y.; $5000; Max Stadlen, Louis Schapiro, Bernard Wolfensohn.

Cleveland Speed Indicator Company, Cleveland, O.; $10,000; to make and deal in speed indicators of all kinds; Arthur Friedman, Leo Friedman, O. Friedman, Marshall R. Stewart.

Sedgwick Manufacturing Company, Richmond, Ind.; $10,000; to manufacture automobile jacks; J. R. Sedgwick. James M. Judson.

Blue Ribbon Garage, Richmond, Va.; $10,000; B. M. Jones, B. H. Grundy, C. B. Grundy.

T. M. S. Manufacturing Company, Indianapolis, Ind.; $25,000; to make a combination front fork and shock absorber; F. M. Strong, W. J. Gemmill, L. W. Mellette.

Motor Starter Manufacturing Company, Indianapolis, Ind.; $40,000; S. M. Brunage, W. J. Sylvester, H. J. Herff.

Arco Rubber Company, Boston; $15,000; William B. Hill, F. E. Black, H. G. Cressinger.

I. & W. Manufacturing Company, Chicago; $1000; automobile appliances and supplies; A. L. Currey, G. W. McIntyre, F. W. Nelson.

National Auto Radiator & Lamp Works, Inc., Brooklyn, N. Y.; $10,000; Julius Pasternack, Milton J. Gordon, Jacob Samas.

Peteler Shock Absorber Corporation, New York City, $50,000; C. L. Moreau, F. D. Lyon, J. L. Allen.

Lawter Tractor Company, Newcastle, Ind.; $10,000; to manufacture tractors; Benjamin H. Lawter, J. C. Goodwin, William H. Goodwin, Orville O. Carpenter.

Hartford Auto Pump & Supply Company, Hartford, Conn.; $50,000; to manufacture motor car supplies; H. F. Schrabe, Edward E. Tyron, T. Lockwood.

Tioma Oil & Grease Company, Inc., New York City; $50,000; to make and deal in oils and greases; F. J. Forhan, F. B. Knowlton, J. J. Harper.

Lister, Smith & Walsh Company, Providnece, R. I.: $50,000; general automobile business; James J. Lister, Herman R. Smith, Wilbur R. Walsh.

Harper Tire & Rubber Company, Canton, O.; $400,000; to manufacture and deal in automobile tires; James Thomas, Albert H. Vayo, Byron B. Baughman, Warren D. Harper, Carroll Brady Bour.

Kendall Auto Company, Pasadena, Cal.; $50,000; to deal in electric and gasoline automobiles; A. C. Kendall, E. A. Truby, S. S. Wilder, W. R. Civington, W. W. Kendall, Don C. Porter.

Fred M. Ross Spring Wheel Company, Cincinnati, O.; $100,000; to manufacture and deal in hubs, wheels, etc.;

Horace Horstman, Otto Huber, Theodore Horstman, Fred M. Ross, W. W. Baxter.

The Only Automobile Company, Charleston, S. C.; $200,000; Lawrence M. Pinckney, M. R. Rivers, Santo Sottile.

Arby Automobile Company, Mt. Pleasant, S. C.; $200,000; L. M. Pinckney, M. R. Rivers, Santo Sottile.

Auto Commission Manufacturing Company, Chicago; $50,000; George W. Nevins, Francis W. Robinson, William J. Liddy, Harry M. Snow.

Armstrong Motors Company, Cincinnati, O.; $10,000; Luella S. Armstrong, Clara M. Eggers, S. S. Stewart, Harry Bronworth.

Unique Engine & Manufacturing Company, Chicago; $2500; to manufacture engines and machinery; E. M. Christenson, Peter Walker, Charles W. Terrio.

United Auto Association, Los Angeles, Cal.; $10,000; Henry W. Bohrman, Burt Dequine, Clarence L. Robinson.

Oakland-Wisconsin Motor Company, Milwaukee, Wis.; $50,000; R. A. Creek, N. M. Creek, A. H. Small.

Rayfield Motor Sales Company of Illinois, Chicago; $41,000; automobiles and accessories; R. C. Wheeler, C. I. Cobb, C. Barnes.

Lacy Motor Delivery Company, Chicago; Herbert Decker, Samuel J. Richman, Franklin H. Lacy.

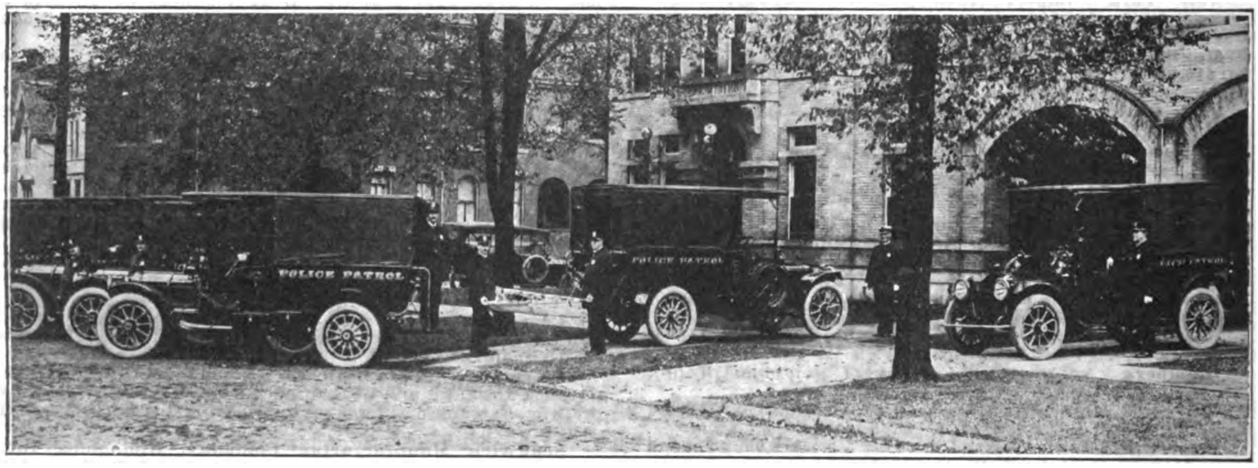
Lawrence Motor Mart, Lawrence, Mass.; $10,000; J. E. O'Neil, J. J. Hurley, D. F. Keefe.

Longwell Automobile Truck & Sales Company, El Paso, Tex.; $10,000; J. J. Longwell, H. M. Andreas, J. A. Tays.

Owners' Auto-Tire Company, Sacramento, Cal.; $5000; to deal in tires; H. C. Muddox, Frank Smith, W. W. Bassett.

Gallatin Motor Company, Jacksonville, Fla.; $10,000; H. T. Phillips, Harry Botts.

Timken-David Brown Company, Detroit, Mich.; $250,000; to manufacture worm gears and worm wheels; Lewis H. Paddock, Eugene W. Lewis, Herbert W. Alden.



A Portion of the Fleet of Packard Combination Ambulances and Patrol Wagons in Service with the Detroit Police Department.

K-E-W Manufacturing Company, New York City; $5000; to deal in automobiles; John Jacobs, W. W. Ward, J. A. Bednarik.

Alling & Miles, Inc., Rochester, N. Y.; $20,000; to deal in motor cars; Edmund M. Alling, Alice R. Alling, Milton B. Miles.

York Supply Company, Greenville, O.; $25,000; automobiles and supplies; C. F. York, A. Z. Heller, J. H. Byard, Lillie M. York.

International Automobile Supply Company, Chicago; $5000; to deal in automobile supplies; William L. Loeffel, Mark T. Adams, William E. Stephens.

Munnich's Garage, Inc., New York City; $500; Christopher Munnich, Elizabeth Munnich, John Munnich.

United States Auto Lock Company, Findlay, O.; $15,000; to manufacture and deal in locks; J. S. Van Tassell, E. B. Brokaw, J. H. Macklin, J. R. Harnahan, G. F. Burnap.

Diamond Stamping Works Company, Cleveland, O.; $35,000; to make motor car parts; J. C. Royon, Phelps Crum, H. H. Henry, M. T. Gorton, Rose L. McCarthy.

Cumberland Garage Company, Brooklyn, N. Y.; $25,000; Willard L. Gray, Alfred Wilmarth, Marie F. Wilmarth.

Dann-Gorman Company, Inc., New York City; $10,000; to deal in automobiles; Thomas F. Dann, John L. Gorman, John B. Gouger.

Gotham Sight Seeing Corporation, New York City; $1000; to operate motor 'buses; George Laury, Louis Brown, David Lebowitz.

Auto Adjunct Company, Melrose, Mass.; A. W. Eldredge, E. J. Sanderson, J. E. Knapp.

Paige-Detroit Auto Company, Little Rock, Ark.; $10,000; J. F. Jones, W. M. Rankin, W. M. Lewis.

Motor Oil & Gas Company, Tulsa, Okla.; $10,000; J. W. Hocker, John Rose, C. S. Walker.

Hobart Manufacturing Company, Troy, O.; motor driven machinery, purchasing assets of Hobart Electric Manufacturing Company; $1,600,000; H. L. Johnston, W. E. Bowyer, E. E. Edgar, W. W. Cope, J. M. Spencer, J. S. Combs.

Henschel Tire & Rubber Company, Inc., New York City; $10,000; Rudolph Henschel, Anna Henschel, William A. Wollman.

American Manufacturing & Distributing Company, Louisville, Ky.; automobile supplies; Harry L. Archey, P. H. Block, H. B. Morrow.

Peerless Tire Company, Inc., New York City; $15,000; Michael Schiavone, George P. Calenda, Louis Schiavone.

Associated Auto Mechanics, Inc., New York City, $100,000; automobile parts, etc.; H. Barnes, C. Tichsnor, W. J. Hoover.

Motor Sales Company, Fort Wayne, Ind.; $10,000; automobiles, supplies, accessories; Carl J. Weber, William J. Ross, William H. Bensman, Thomas M. Connell, Charles Galex, W. H. Hess.

Harbar Auto Heater Company, Augusta, Me.; $300,000; to construct, operate, market and deal in all kinds of motor vehicle attachments and accessories; R. S. Buzzell, L. J. Coleman.

Washington Street Garage Company, Green Bay, Wis.; $10,000; K. E. Fosha, L. R. Larson, F. L. Fosha.

Auto Service Company, Uniontown, Penn.; $5000; C. W. Johnson, Fred A. Close, F. B. Hess, R. M. Campbell, Max Hannan, E. G. Snyder, J. C. Donahue, G. T. Lewis, D. D. Haroder, A. E. Corns.

Stafford Illuminated Auto Lamp & Number Company, Chicago; $50,000; to make automobile accessories; F. S. Stafford, W. Doran, F. W. Schaub.

Norwalk Motor Car Company of New York, New York City; $35,000; P. Lyndon Bryce, Alfred L. Kirby, Edward S. Murphy.

Motor Coach Company, Inc., New York City; $500,000; automobiles, motor car hearses and burial coaches; Samuel Richenthal, Elbert R. Benyunes, Herman Miller.

Shepherd Auto Company, Inc., New York City; $5000; Irving R. Shepherd, Fannie R. Shepherd, Joseph A. Shepherd.

WITH THE MANUFACTURER.

The Packard Motor Car Company, Detroit, Mich., has placed a number of Packard combination ambulances and patrol wagons with the police department in that city. An accompanying illustration shows a portion of the fleet, concerning which the department officials express themselves as thoroughly satisfied in every particular. It has been found that these machines make a decided saving over the use of horse drawn vehicles.

The Torbensen Gear & Axle Company, Newark, N. J., maker of internal gear drive truck axles, has concluded arrangements with Brandenburg & Co., New York, Chicago and Detroit, to act as general sales agent and direct factory representative of the company's product.

The Allen Wrench & Tool Company, Providence, R. I., has closed a contract with W. A. Bryte, 788 Mission street, San Francisco, Cal., manufacturers' agent. Mr. Bryte will handle the Allen friction wrench in all the western territory, including the Pacific coast region.

R. B. Tracy, western manager of the Michelin Tire Company, Milltown, N. J., has opened a new branch at 1106 Hennepin street, Minneapolis, Minn. This branch will care for the territory of North and South Dakota, Minnesota and Northern Wisconsin.

The Henderson Motor Car Company, Indianapolis, Ind., maker of Henderson cars, announces the appointment of Harry W. Doherty as northwest district manager with headquarters at Tacoma, Wash., Mr. Doherty enjoys a wide acquaintance in trade circles.

The Coronet Manufacturing Company, Wade building, Cleveland, O., has taken over the manufacture and sale of the Coronet hub mile recorder, which, it was announced several months ago, was made by the Servis Recorder Company of the same city. The Service travel recorder which the Servis Recorder Company has been marketing for the past two years is still controlled by that company. Both concerns are now entirely distinct, neither having an interest in the other or its products.

The Standard Roller Bearing Company, Philadelphia, Penn., maker of steel, brass and bronze balls, ball and roller bearings and axles and steel castings, has opened an office in the State Life building, Indianapolis, Ind., in charge of L. M. Watkin, Jr. Owing to the big demand for the company's product it was found necessary to divide the territory formerly covered by the Chicago office.

The American Motors Company, Indianapolis, Ind., maker of American cars, at a meeting of its stockholders, re-elected the entire board of directors and also the following officers: General manager and chairman of directors, V. A. Longaker; president, J. I. Handley; vice president, D. S. Menasco; treasurer, J. D. Bright.

The Dunlop Tire & Rubber Company, Toronto, Can., has acquired from the Century Rubber Company of New York the exclusive rights to manufacture and sell Fabricord tires in the Dominion, where the tires will be known as the Dunlop-Century Fabricord tires.

W. H. Rudd, proprietor of the Rudd Auto Top Company of Detroit, has purchased the business of the National Top & Curtain Company, formerly located at 865 Woodward avenue, that city, and has consolidated it with the Rudd establishment at 46 Bagg street.

The Federal Rubber Manufacturing Company, Milwaukee, Wis., has opened a branch at 1833-35 East 13th street, Cleveland, O. G. Couturier is in charge.

The Studebaker Corporation, Detroit, Mich., maker of Studebaker cars, is said to have secured profits for the year ending Dec. 31, 1912, for manufacturing and trading, amounting to $3,342,560, an increase of $650,712. The surplus, after making all charges, amounted to $2,212,245, an increase of $659,663.

The Fisk Rubber Company, Chicopee Falls, Mass., has announced the immediate construction of two more extensive additions to its factory. A large addition increasing the capacity of the plant 100 per cent. was recently completed, but further expansion became necessary to meet the demand for Fisk tires.

The Ohio Electric Company, Toledo, O., maker of Ohio electrics, is enlarging its plant to care for increased business.

The King Motor Car Company, Detroit, maker of King cars, will be partly conducted on the co-operative basis, as Artemas Ward, who holds 75 per cent. of the stock, will divide 10 per cent. of his earnings with the employees.

The Fisk Rubber Company, Chicopee Falls, Mass., maker of Fisk tires, in accordance with the reorganization plans when it transferred its charter from Delaware to Massachusetts and increased its capital to $15,000,000, has increased its board of directors by the addition of R. B. McGraw and E. A. Luddington. The other directors are President H. T. Dunn, Vice President J. C. Cole and Treasurer H. G. Fisk, who constituted the original board.

The Benz Import Company, 248 West 50th street, New York City, announces that it has been informed that the Kaiser prize of 50,000 marks for the best aviation motor was won recently by the Benz company.

The Marion Motor Car Company, Indianapolis, Ind., has gathered together various newspaper and magazine articles relative to Marion cars and published them in a neat pamphlet, for distribution among its agencies.

The Republic Rubber Company, Youngstown, O., through its board of directors, has decided to erect a club house for the employees.

The Apperson Bros. Automobile Company, Kokomo, Ind., maker of Apperson cars, has announced a change in its New York representative, having closed a contract with the Shepherd Auto Company, 318-320 West 48th street, to handle Apperson cars in the metropolitan section, including a number of Hudson river counties and parts of Long Island, New Jersey and Connecticut.

The Etablissements Bergougnan, Clermont-Ferrand, France, is rapidly perfecting a system of distribution by states, following the recent establishment of an American selling branch at 49 West 64th street, New York City. It is understood that the French house is offering unusual inducements to jobbers and others, a sliding scale of discounts having been adopted with a view to hastening a general trial of Gaulois tires by users all over this country.

H. W. Miller has been added to the sales organization of the Lozier Motor Company, Detroit, maker of Lozier cars. Mr. Miller was formerly connected with the sales department of the Studebaker Corporation, Detroit, maker of Studebaker machines, under Paul Smith, now sales manager of the Lozier company.

William R. McCulla has taken a position with the Packard Motor Car Company, Detroit, maker of Packard cars and trucks, as assistant research engineer. Mr. McCulla has had a wide experience in the automobile industry.

William J. Hughey & Son, Chicago, maker of high grade limousine and automobile bodies, is to build a four-story concrete addition to its plant at a cost of $100,000.

NEW CONCERNS AND PROPRIETORS.

The Blair Auto Company, located at 414 South Main street, in the Beard building, Aberdeen, S. D., is a new concern which handles the Chalmers cars. Fred J. Ertz, who was formerly employed in the Chalmers factory at Detroit, is manager.

L. J. Graves has purchased of C. H. Walker a livery barn property which he has converted into a garage.

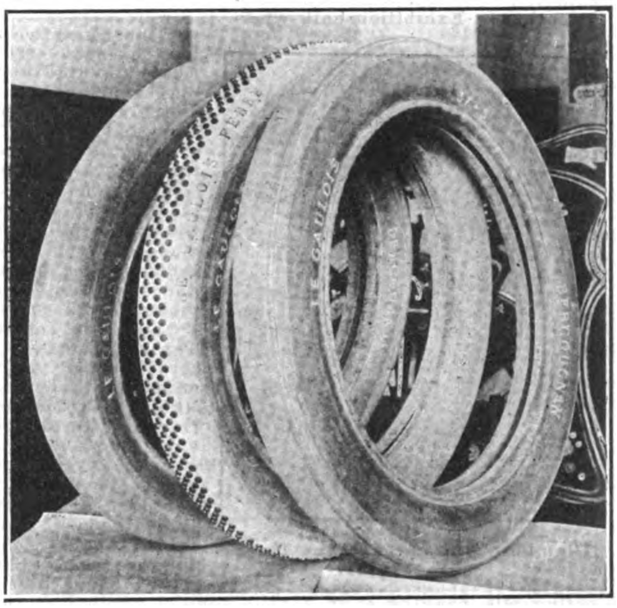
The Calcasieu Motor Car Company, Lake Charles, La., has opened for business at 210 Pujo street. Albert M. Miller is at the head of the firm and associated with him is H. B. Chambers, who will look after the mechanical department. In addition to the general garage and repair business the firm has the agencies for the Stutz and Speedwell cars.

Schiller & Creswell, Utica, N. Y., has purchased the brick gas storage building at Noyes and Francis street, which will be transformed into an up-to-date electric garage.

H. K. Boyles of Findlay, O., has purchased a half interest in the Main garage on North Main street, that city, of C. A. Burton, who was formerly sole owner. The garage will now be known as the Burton & Boyles Garage.

Henry Schultz, Ralph Peterson and Frank Hinshaw have purchased the Frank P. Fox garage at 811-818 Ohio street, Terre Haute, Ind. The two first named were former employees.

The Ferguson, Mohn Company, Phoenix, Ariz., has sold its automobile business, garage, agency and all accessories to the Arizona Land & Investment Company, which has taken two new members into the firm, R. D. Roper and H. L. Bird, well known business men.



Gaulois Tires of French Make Now Being Introduced in America.

The Auto Parts & Repair Company, Springfield, Mass., has been formed and has leased a part of the former plant of the Atlas Motor Car Company's plant in that city. The company is under the management of P. A. Williams, Jr., late of the Atlas company, and will repair Atlas cars as well as other makes.

Charles C. Diebold has retired from the Diebold-Peters Company, Cleveland, O., which made automobile parts, and with others has organized the Diebold Products Company in the same city. The concern will operate a plant on St. Clair avenue.

The Fourth Street Garage, San Francisco, Cal., said to be the largest ground floor garage west of Chicago, has changed hands and is now owned by the Pacific Sightseeing Company, Inc.

The Holt-Chandler Company, New York City, has opened a service department in the Galvin building, Long Island City, N. Y., in order to care for the service to Flanders and Maxwell cars. The service station will accommodate 75 machines.

W. H. Gragg has purchased the garage of R. R. Allen & Sons, Beloit, Wis., formerly known as the Vale Garage, and will fully equip it to do all kinds of repair work.

R. W. Wilmerton, C. C. Wilmerton and K. V. Johnson of Rock Island, Ill., have purchased the fixtures and accessories of the former Galena Auto & Manufacturing Company, South Main street, Galena, Ill. They have also rented the building and heavy machinery of the concern and have opened a modern garage and repair shop.

Sinclair & Horn, for several years in the service department of the Union Electric Company, former distributor of Rauch & Lang electrics, has opened a garage and repair shop at 4630 Olive street, St. Louis, Mo., and will give service to the owners of electric vehicles.

The Southwest Motor & Garage Works on West Third street, Carthage, Mo., has been purchased by C. H. Ziler and T. V. Grieb, from E. B. Jacobs, trustee. Mr. Grieb will not be actively engaged in the business.

William Gilligan, formerly of the Morgan Garage & Supply Company, and Edward Priebe, until recently of the Rhinelander Iron Company of Rhinelander, Wis., have entered partnership and have established a garage and repair business in that town under the firm name of Oneida Garage & Machine Company.

Carl H. Page & Co., New York distributor of Chalmers cars, has opened a branch at Bedford avenue and Fulton street, Brooklyn, N. Y. Harry Unwin, who has been with the Page company more than eight years, is manager of the branch and associated with him are C. M. Dow and A. R. Tator.

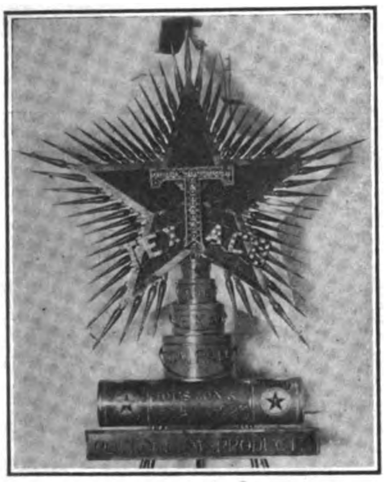
Rene J. Marx has resigned as general manager of the Simplex-Mercer Pacific coast agency, to take up the distribution of Mercedes cars west of the Mississippi river. He has strong financial backing and the new firm will be known as Rene J. Marx & Co., with Marx as president and general manager and Paul La Croix as vice president.

Oliver Nichols has leased a building at Owasa, Ia., where he will conduct an automobile repair shop.

Marion Grigsby of Bushnell, Ill., has rented the New garage and will do a general automobile, sales, repair and supply business.

E. E. Davis has sold his garage on South Market street, Paris, Tenn., to Paul Freeman, who is conducting the business.

The Texas Oil Company, New York City, possessed an exhibit at the recent Boston show that attracted unusual attention in Exhibition hall, where the well known Texaco lubricants were to be seen. The centre of the display was the monster illuminated red star and green T, comprising the trade mark of this company. The large star, visible across the entire hall, was made of rich red Bohemian glass, and on this was mounted the green T and the name Texaco in brass letters studded with miniature electric lights. A nickeled frame outlined the star and bore a number of sockets, each of which was a holder for a ray shaped glass container. These containers were filled with various lubricating oils, ranging from a ruby colored product at the apex of each point to an almost white oil at the base. The whole was illuminated by powerful electric lights concealed behind a frosted glass star shaped background.


Illuminated Trade Mark at Texaco Oil Display.

The Colt-Stratton Company, New York City, eastern distributor of Cole cars, has established a used-car department at 1876 Broadway. It will have an organization of its own and will be under the management of W. H. Barnard, formerly of the Packard Motor Company.

The W. B. Sheip Rubber Company, dealer in tires and automobile accessories, has opened for business at 915 Main street, Houston, Tex. The tires handled are the Republic, Century and the Prowodnik.

C. A. Harrah & Son is the latest firm to enter the automobile field at Bushnell, Ill. It has the agency for the Paige car.

O. H. Miller and H. K. Nichols have established an automobile business at 310 West Villard street, Dickinson, N. D. In addition to a modern repair shop the firm will handle the Ford car and parts, made by the Ford Motor Company, Detroit.

The Red Wing Company and Remshardt & Oliva, Red Wing, Minn., have consolidated and will operate under a new name. The old building, formerly used by these concerns, has been closed and a new one recently erected is being occupied.

The Beloit Automobile & Machinery Company, Beloit, Wis., has been formed and has taken the agency for several makes of cars. A general line of machinery is also carried.

Fred O. Grimes has opened a new garage at the corner of Covington street, Hillsboro, Tex. The building was completely remodelled and an up-to-date machine shop was installed. Mr. Grimes carries a full line of automobile accessories.

Ralph Catlin has purchased the garage and business of F. W. Hawley at Montrose, Penn., and will operate it under his own name.

P. R. Long and M. C. Cheney, Deming, N. M., have dissolved partnership, Mr. Long taking over the interest of Mr. Cheney. The former will conduct a first class garage as formerly.

The Robbins Auto Company, Malvern, Ia., has sold its garage, repair shop and automobile business to Salyers & Kayton, who are conducting the establishment.

The West Side Garage Company, Grand Rapids, Mich., has established a garage on West Bridge street. Lee Rockwell and L. D. Van Hof, members of the company, will also conduct a first class repair department.

W. S. Bashaw, owner of the Detroit Electric Car Company, has opened business at 108 Brady street, Davenport, Ia., and will handle the Detroit electric line, made by the Anderson Electric Car Company, Detroit.

The Price Hill Auto & Garage Company, recently formed at Cincinnati, O., has been changed to the Radel Auto & Garage Company, and the capital stock has been increased to $100,000. John J. Radel is president of the new concern.

Charles E. McFarlan and Hal Norton of Topeka, Kan., have purchased the business of the Kansas Motor Car Company at 526-528 Quincy street. Mr. McFarlan is manager.

L. C. Rockwell and L. D. Van Hof have opened a first class garage at 406 Scribner avenue, Grand Rapids, Mich.

Morris H. Wilcher of Rock Island, Ill., has established a modern garage at 1516 Fourth avenue.

The Viaduct Garage, Union, N. J., formerly owned by William Moeller, Park avenue, has been taken over by Louis A. Chatterton and William L. Draffin.

The White Motor Car Company, Nashville, Tenn., has been incorporated with capital of $10,000. The firm will continue to operate its garage at 102-106 Third avenue. G. A. Purvear is president and E. S. Craig is secretary, treasurer and manager.

The Cartercar Houston Company, Houston, Tex., has leased the building at 1409 Main street and will be the South Texas distributor for Cartercars, made by the Cartercar Company, Pontiac, Mich. The firm was recently incorporated with capital of $20,000 and the following officers: President and treasurer, R. H. Bushway; vice president, E. Emert; secretary, C. D. Ferguson.

Nolan Bros., Memphis, Tenn., which was recently incorporated by J. W. Dickson, Dr. W. S. Anderson, E. E. Becker and others, will operate a garage at 291-295 Jefferson avenue, that city.

The Forest Street Garage, of which Joseph Maurie is manager, has been completed and is open for business at Gloversville, N. Y. The company will handle Metz and Inter-State cars.

Will L. Gould has purchased the interest of his brother in the firm of Gould Bros., Watertown, N. Y., and will continue the business at 223-227 King street, as the Gould Automobile Company.

Dolan & Lewis has occupied a new garage at Springfield, Tenn. The structure is of brick and is equipped with all modern appliances and supplies.

B. F. Rowe of Orlando, Fla., has purchased an interest in the Sanford Machine & Garage Company of Sanford, Fla., and has moved to that place.

L. K. Fargo and F. B. Vaccaro of Modesto, Cal., have taken possession of the garage on L street in that town and will conduct a general garage and repair shop.

A. J. Parker & Co., and the Howells Garage & Supply Company of Howells, Mich., have consolidated under the name of Parker-Spencer Company and the future location will be in the Garage Company building.

Kail & Larson has opened a garage on Main street, Lohrville, Ia., and an up-to-date repair shop has been added.

The M. S. H. Sales & Rubber Company, Philadelphia, Penn., has opened a branch agency at 660 North Broad street and will carry a full line of standard tires, etc.

The American Motor Car Company, Cleveland, O., has reorganized under the name of the Northern Motor Company, with C. V. Lloyd as manager. The concern is located at 6016 Euclid avenue and is distributor for American and Marion cars.

C. C. Dorman and J. C. Dorman of Gary, Ind., who have formed a partnership, have opened a salesroom in the building at 508 Washington street.

The Gray & Mack Sales Company of 1114 South Michigan avenue, Chicago, has become distributor of the product of the Air-Friction Carburetor Company for the Middle West. The new model B is ready for distribution as well as the new motorcycle carburetor. These models offer new and attractive features.

Samuel Houser and R. N. Howes of Omaha, Neb., have formed an organization to handle the Stevens-Duryea cars, made by the Stevens-Duryea Company, Chicopee Falls, Mass., in Iowa and Nebraska. The new firm is located at 102 Farnham street, Omaha.

Howard Tracy has opened a repair shop on Orange street, Ashland, O.

R. K. Woodrum and Bruce Purvis have established a garage and repair shop business at Louisburg, Kan.

The R. P. Smith Garage at Port Arthur, Tex., has been purchased by R. E. Howland and George Wynall.

A. B. Neyhart has purchased the Sixth street garage at Stroudsburg, Penn.

Ralph Schwartz has purchased an interest in the Central Motor Company of Reading, Penn. The firm will in future be known as H. B. Schwartz & Son.

The Vermont Garage & Machine Shop is the style of a new firm which has opened an establishment on Pleasant street, Bennington, Vt. H. Harry Levin and Joseph J. Martin are members.

The Marathon Sales Company, Cedar Rapids, Ia., has opened a salesroom at 414 Third street. The Marathon car will be handled under the management of F. M. King.

The De Sota Motor Company is an new entrant in the automobile field at Des Moines, Ia., with headquarters at 918 Walnut street. V. H. Van Sickle is the proprietor.

F. J. Rie and Ray Davis have established a tire repair business at Petaluma, Cal., under the style of Petaluma Tire Repair Company.

Timothy Hurley has purchased the garage business of George M. Height and Theodore Bennett of Spring Lake, N. J., who have entered another line of business.

W. E. Dehler of Crane, Wis., has purchased the interests of Peter Herring in the Bloomer Auto Garage & Supply Company, Bloomer, Wis.

Dyche & Duncan, Columbus Junction, Ia., has rented the Ott building at Columbus City, Ia., and transformed it into a garage. The firm will handle Michigan and Case cars.

Clarence Bowers of LaCrosse, Wis., who has been in the employ of T. T. Bergh Company for several years, has entered business for himself at Caledonia, Minn., and is having a garage erected on property recently purchased.

William Bassett, Fairmont, Minn., who recently purchased the interest of his partners, Porter Bros., in the First street garage, has sold a half-interest in the business to Fred Gust and the firm will in future be known as Bassett & Gust.

The Service Motor Car Company, Plainfield, N. J., distributor of Abbott-Detroit, Henderson and American cars, has purchased the stock and fixtures of the C. B. Brokaw Auto Company and is now open for business at 149 East Fourth street, under the management of George R. Morris, founder of the old firm of Morris Auto Company. The officers of the company are: President, E. A. Craig; vice president, Frederick Harrington; treasurer, George Morris; secretary, L. A. Rogge.

W. R. Derrick, owner of the Capitol Stables, Vellejo, Cal., will establish a complete garage in connection with his livery business on Capitol street. He will install modern machinery.

The Topp Garage, 134 Cortland avenue, Syracuse, N. Y., has established a first class service station in connection with its business and is enjoying a prosperous trade. Ignition and carburetion is made a specialty and expert and prompt service is given.

G. H. Kuiper has opened a garage on Grand avenue, Grand Rapids, Mich., and in addition to a general garage business a first class repair shop will be operated.

M. Nesbit, Winfield, Ia., has purchased the garage of the Winfield Auto & Supply Company, and together with his son will conduct the business and do repair work.

Owens & Laws, formerly of Denver, Col., have opened a new garage at 285 North Thomas street, Pomona, Cal. The latest improved machinery has been installed and a specialty will be made of repair work.

G. H. Hafemeister Motor Company, Watertown, Wis., recently purchased the A. E. Puerner garage at Ft. Atkinson, and took immediate possession. Max Lounsbury is in charge of the business.

NEW BUILDINGS AND REMOVALS.

The Benrich Motor Company, Los Angeles, Cal., distributor of Moline cars, has located in new quarters at 1732-40 West Washington street. The wholesale branch, under O. J. Root, Pacific coast manager, is also at that address.

The Lucia Garage, Green Bay, Wis., is being enlarged at a cost of $4000.

The Chalmers Motor Company of Illinois is situated in its new home at 23rd street and Michigan avenue, Chicago. James Levy is at the head of the company.

The Bagnell Automobile Company, St. Louis, Mo., has leased a store at 1512 Locust street, for use as a subsalesroom of cars taken in exchange. The store was formerly occupied by the Major Automobile Company.

The Cedar Rapids Auto & Supply Company, Cedar Rapids, Ia., has made extensive improvements to its garage on Fourth street. Included in the additions is a rest room for women visitors and the appointments are elaborate.

Frank Mulkern and M. L. Annenberg have purchased the new building on Dawner avenue, Milwaukee, Wis., which is being fitted up as a modern garage, having ample space for 200 machines.

F. A. Emendorfer of Saginaw, Mich., has completed improvements to his garage at 207 North Harrison street. He has the agency for Reo cars, made by the Reo Motor Car Company, Detroit.

The Barton Motor Car Company, Cedar Rapids, Ia., has occupied its new garage on Second avenue. The plant is thoroughly equipped and is one of the finest in Iowa. The rear of the building will be occupied by the Moore Auto Company, which will conduct a machine shop completely equipped with modern machinery.

The Bolton Auto Company, 204-206 North Washington avenue, Saginaw, Mich., has taken possession of its new building at that address. The opening of the new plant was the occasion of the firm's first annual automobile exhibit.

A. E. Reed, distributor for the Overland line at Louisville, Ky., has leased the former home of the Oldsmobile on Fourth street, in order to secure more room. The lease was for five years at $4800 a year with the privilege of renewal for five years at $6000 a year.

The American Taxicab Company, Reading, Penn., has moved from 112 North Eighth street to 730 Court street, where it will occupy three floors. A fully equipped machine shop has been established.

The East Side Garage Company has been formed at Altoona, Penn., and has opened a temporary garage on Ninth street. The company will erect a modern building on Greene street.

G. H. Decker, who conducts a modern garage at 3828 Hudson boulevard, Hoboken, N. J., is planning enlargements to his building.

The Geneva Automobile Company, Geneva, N. Y., is erecting a large addition to its garage on Main street.

The Clifton Garage, Union, N. J., is making extensive improvements to its plant at Third street and Union Hill.

Dunkelberger & Lesher is the name of a new firm at Kutztown, Penn., for which a new garage has been erected. In addition to repair work the company handles Ford cars, made by the Ford Motor Company, Detroit.

The Quincy Motor Company, Quincy, Ill., has occupied its new, modern repair shop at 716 York street.

The Oriental Rubber & Supply Company, Brooklyn, N. Y., has moved from its former location on Bedford avenue to the corner store in the Tollner block, Bedford avenue and Madison street. The company carries a full line of Federal tires and motor requisites.

The Rapids Auto & Supply Company, Alexandria, La., which was formerly located on De Soto street, has moved to the Barrett building.

The Bryan Motor Car Company, Houston, Tex., has moved into its new quarters in the Edge building, recently completed.

J. Woodruff Eldredge, Cape May, N. J., has purchased property on Columbia avenue and will erect a large, modern garage building to be the largest in the state. It will be fireproof and will contain a first class machine shop.

The Universal Auto Repair Company, Hartford, Conn., has been reorganized and will hereafter be known as the Universal Auto Company. The concern has secured large quarters in the Whitmore building.

Carson & Granger has erected a new garage at San Jose, Cal., and will handle the Haynes cars, made by the Haynes Automobile Company, Kokomo, Ind.

The Carl Christensen Motor Car Company, San Francisco, Cal., distributor of Detroiter cars, made by the Briggs-Detroiter Company, Detroit, has moved to new quarters at 567 Golden Gate avenue.

The Worcester Automobile Company, Worcester, Mass., distributor of Studebaker cars, made by the Studebaker Corporation, Detroit, has moved into its new garage at the corner of Warren and Cherry streets.

The Miller Automobile Company, Woodstock, Vt., will enlarge its garage to double its present capacity. Increasing business made the change necessary.

The Brooks-Norton Motor Sales Company, Cleveland, O., has moved into new quarters at 2169 East Ninth street. The company handles Ohio electrics, Schacht trucks and Modern trucks.

The Elyria Auto Sales Company, Elyria, O., is erecting a new automobile building on East Broad street. The building will include a repair department, storage and salesrooms.

Charles J. Conohan of the Lake Side Livery, Milwaukee, Wis., has completed a new modern garage to be operated in connection with his livery business.

Harry Salvat of the Fashion Automobile Station at 4610 Cottage Grove avenue, Chicago, will soon erect a large fireproof electric garage at 51st street. It will have a capacity to care for and charge 450 cars.

The Warren Automobile Company, St. Louis, Mo., has outgrown its old quarters and has moved into a new establishment at 3018 Locust street.

The Colt-Stratton Company, New York City, eastern distributor of the Cole cars, has moved to larger quarters on Broadway, at 58th street, increasing the space of its service department. The wholesale offices are located on West End avenue, at 63d street. W. F. Wilcox has been made advertising manager and F. G. Wilcox of Detroit has been engaged as service expert.

The Davis Auto Company, of which Walter Davis is the head, has established larger quarters at 311 Virginia street, Joplin, Mo.

The Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars, has established an up-to-date service station at 325 North Pennsylvania street, Indianapolis, Ind. George O. Wildhack is manager.

The Biddeford Motor Mart, Biddeford, Me., distributor of Studebaker cars, is now located in the new Goodwin building under the management of W. F. Goodwin. The rooms are said to be the most attractive east of Boston.

W. C. Spear, head of the Manchester Auto Garage, Manchester, N. H., is to erect a new garage and salesrooms on Granite street.

Massa & Questa, Olean, N. Y., is planning the erection of a new garage.

Andrew Murphy & Son, 1410 Jackson street, Omaha, Neb., has plans for a new garage to cost $10,000.

The F. O. Engstrum Company of Los Angeles, Cal., is to have a new garage erected at a cost of $30,000.

George F. Fleet, proprietor of the People's Taxicab Company, Altoona, Penn., is planning for a new garage on Beale avenue.

The E. V. Stratton Company, Albany, N. Y., Hudson and Stewart distributor for eastern New York, western Massachusetts and Vermont, has leased for a term of years the premises now occupied by C. S. Ransom on Chapel street opposite the Hotel Ten Eyck. The building will be refinished inside and out, with stock and supply department and offices fitted up at the rear and an attractive showroom at the front.

The Souhegan Auto Company, Milford, N. H., has moved into its new, modern garage on Nashua street.

The Pierce-Arrow Sales Company, San Francisco, Cal., distributor of the Pierce-Arrow cars, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y., has vacated its Van Ness avenue headquarters and taken temporary rooms at Geary and Polk streets until its new four-story home on the opposite corner of the same streets is completed.

The Bickens-Spears Motor Company, Los Angeles, Cal., agent for the Lozier and Abbott-Detroit cars, has leased property on which will be erected a large modern garage to cost approximately $50,000.

Elmer Ludwig, who for four years has conducted an automobile business at Moline, Ill., has occupied a new garage on Sixth avenue and is making a specialty of repair work.

The California Motor Company, Los Angeles, Cal., distributor for the Packard cars, made by the Packard Motor Car Company, Detroit, has taken possession of its new five-story garage and service station. It is said to be one of the most elaborate buildings of its kind in the country.

Members of Lynn Automobile Dealers' Association in Charge of Recent Show: President Harry Doane in Centre, Secretary-Treasurer Percy I. Reynolds at Right, S. P. Tierney at Left.

TRADE PERSONALS.

Fred W. Bajus is reported to have been appointed superintendent of the plant of the Maxwell Motor Company in Newcastle, Ind., a position he held for two years while it was owned by the Maxwell-Briscoe Company.

Lyle Devlin has joined the sales force of the Detroit branch of the Winton Motor Car Company.

J. F. Richman, for the past four years superintendent of the Hudson Motor Car Company, has joined the Cole Motor Car Company, Indianapolis, as factory manager.

Joseph L. Hall has been made manager of the electric sales department of the Archey-Atkins Company, Indianapolis, Ind., and will care for the sale of Detroit electric trucks and pleasure vehicles in that city.

J. C. Austin, formerly chief engineer at the factory of the Regal Motor Car Company, Detroit, is now engineer of passenger vehicles under Chief Engineer James G. Heaslet of the Studebaker Corporation, Detroit.

Arthur G. Kerrigan, for many years connected with the Autocar Company's branch at Boston, has resigned to join the sales force of the R. & L. Company, eastern distributor of Garford pleasure and commercial vehicles, at 915-921 Boylston street.

O. E. Stoll has been appointed assistant sales manager of the General Motors Truck Company, Pontiac, Mich., to succeed E. J. Kilborn, who has become manager of the Chicago branch.

Fred J. Wagner, well known as an official starter for A. A. A. contests, is now at the head of the Consolidated Lubricants Company, which is to be known in the future as the Wagner Oil Company, New York City.

T. R. Walker has joined the sales force of the Abbott Motor Company and will be attached to the branch at Pittsburg, Penn.

F. N. Schwab has taken the position as manager of the Chicago branch of the Speedwell Motor Car Company, Dayton, O., maker of Speedwell cars.

Horace De Lisser, formerly vice president of the United States Motor Company, is reported to have arranged to join Benjamin Briscoe in the manufacture of a new car when Mr. Briscoe returns from France with his completed model in May. Mr. De Lisser will not state whether the cars will be made in Detroit or elsewhere.

H. G. Harper has been appointed inspector general of the Studebaker Corporation's automobile division at Detroit.

R. G. Ames has been made branch manager of the Motometer Company, New York City, which manufactures a new device attached to the radiator cap for indicating the heat of the motor.

G. A. Gemmer, formerly of the Gemmer Manufacturing Company, Detroit, is organizing a company to manufacture an air starter which he has invented, which will be made in Detroit.

Lynn, Mass., is fortunate in having three such progressive automobile dealers as Harry Doane, Percy I. Reynolds and S. P. Tierney, who assumed control of the recent automobile show in that city with excellent results. Mr. Doane has been honored by his associates with the presidency of the Lynn Automobile Dealers' Association, while Mr. Reynolds is secretary-treasurer.

Ward P. Haines has been appointed advertising manager of the Anderson Electric Car Company, Detroit, maker of the Detroit electric. He will succeed W. J. St. Onge, resigned.

W. B. Harding has resigned his position as assistant to the president of Carl H. Page & Co., New York City, to become identified with the selling force of the company.

W. C. Leland of Cadillac Motor Car Company, Detroit, maker of Cadillac cars, is making arrangements to entertain the British and other foreign engineers who will attend the great international congress of the Society of Automobile Engineers in Detroit, June 4. The freedom of the Cadillac plant will be extended to the visitors.

C. W. Whitson, stated to be one of the organizers of the K-R-I-T Motor Car Company, Detroit, has been added to the field staff of the Keeton Motor Company, Detroit, and will cover eastern territory, New England excepted.

J. T. Rose of Washington, D. C., has been appointed manager of the Invader Oil Company's branch in that city.

W. C. McElwain, manager of the Stewart-Warner speedometer branch at Cincinnati, O., has resigned that position to become Ohio representative of the Hoffecker Company of Boston, with headquarters at Cleveland.

Charles W. Cross, for 10 years identified with the automobile trade, latterly with the sales force of the General Motors Truck Company, Pontiac, Mich., has been appointed manager of the Holly Bros. Company, Detroit.

Chester Carroll, formerly assistant to F. R. Bump of the R-C-H Corporation, Detroit, has joined the sales department of the Hudson Motor Car Company, Detroit.

Glenn Buck has become advertising manager of the Ford Motor Company, Detroit. He formerly held the Ford account while connected with the Glenn Buck Advertising Company of Chicago, which he has disposed of.

The Anderson Electric Car Company, maker of the Detroit electric, has appointed Walter E. Holland manager of its mechanical and electrical research department. Mr. Holland is an electrical engineer of high standing and his reputation as an authority on storage batteries and their applications is well known. From January, 1911, to February, 1913, he was chief electrical engineer of the Edison Storage Battery Company of West Orange, N. J. He was associated with the Edison companies as early as 1902, aiding in the development of the first types of the Edison battery, which included tests of lead-acid batteries and road tests of various kinds of electric vehicles, equipped with both types of battery. Subsequently he was closely connected with Thomas A. Edison in various lines of research work and won the high personal regard of the great inventor. Mr. Holland is responsible for many important discoveries in connection with storage batteries and has invented a number of improvements in them.

Walter E. Holland, Electrical Expert, with Anderson Electric Car Company.

Wallace Hood, sales manager of the Westcott Motor Car Company, Richmond, Ind., has made plans to open a showroom at Detroit for the Westcott company.

I. W. Penniman, formerly with the Goodyear Tire & Rubber Company, Akron, O., is now the New England sales manager for the Walpole Tire & Rubber Company, Walpole, Mass., with sales offices at 757 Boylston street.

M. Beauchamp, actively identified with the motor world of Chicago for several years, has formed the Motor Supplies Company, located at 1200 Michigan avenue, and is handling a general line of automobile and garage supplies.

Frank M. Ridler has been promoted to the post of sales manager of the Pope Manufacturing Company, Hartford, Conn.

Porter R. Walker has joined the sales force of the Abbott Motor Company, and following his appointment left on an extended trip as special sales representative.

Joseph W. Fraser, formerly connected with the Packard Motor Car Company, at the Detroit factory, has taken a position in the sales department of the Packard Motor Car Company of New York City.

R. W. Phelps has resigned his position as sales manager of the Great Western Automobile Company, Davenport, Ia., to become assistant sales manager of the Moline Auto Company of the same city.

W. R. Bliss has been appointed manager of the branch at Portland, Me., of the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires. Mr. Bliss goes to Portland direct from the factory.

B. L. Byrket, formerly assistant branch manager of the United Motors Company's Indianapolis branch, has been secured by the Gibson Automobile Company of Indianapolis, distributor of Overland cars and Pennsylvania tires. Mr. Byrket will take care of all Overland business in Marion county.

Earl W. Winans, for the past two years chief engineer of the R-C-H Corporation, Detroit, has resigned to take the position of chief engineer of the Stoddard-Dayton plant of the Maxwell Motor Company, situated at Dayton, O.

B. Anderson-Smith of London, England, who has had a wide experience in the motor car field in Europe, has become associated with the Reimers Motor Car Company, Louisville, Ky., in charge of the sales department. Mr. Anderson-Smith is a member of a family connected with the British nobility.

G. E. Livingston has been appointed manager of the branch of the B. F. Goodrich Company at Columbia, O., to succeed C. W. Walker, who has been transferred to the branch at Toledo, O.

R. A. Dobyns has joined the New England branch of the Kissel Motor Car Company, Hartford, Wis., with headquarters at Boston. He was formerly with the Whitten-Gilmore Company of Boston.

J. T. Caldwell, formerly with the United States Motor Company, has received the appointment as sales representative of the Abbott Motor Company for Ohio.

C. J. Byrne, formerly with the Western Display Company, St. Paul, Minn., has become manager of the St. Paul Cartercar Company, 352 Minnesota street.

Herbert L. Bogardus, well known in the automobile sales field, has joined the sales force of the G. E. Thomas Company, Columbus, O., agent for the Studebaker line.

J. M. Dunwoodie, sales manager of the Dayton Motor Car Company, Dayton, O., was recently the guest of honor at a banquet at the Phillips house, Dayton.

Treasurer A. R. Erskine of the Studebaker Corporation, Detroit, maker of Studebaker cars, announces the appointment of Charles D. Fleming as assistant to the treasurer.

Charles de Freminville, technical director of Panhard & Levassor, maker of the first car produced in France, the Panhard, is at present visiting the American automobile industry as the guest of President R. D. Chapin of the Hudson Motor Car Company, Detroit, maker of Hudson cars.

Harvey M. Briggs has succeeded Otto R. Bieler as engineer of the Lord Baltimore Motor Car Company, Baltimore, Md., builder of Lord Baltimore trucks.

Harold D. Bornstein, well known in Boston and New England as a member of the staff of the Boston branch of the Velie Motor Vehicle Company, Moline, Ill., maker of the Velie line, has joined the Boston sales force of the Premier Motor Car Company, Indianapolis, Ind., maker of Premier machines.

C. W. Thompson, Rochester, N. Y., formerly New York state distributor for the Cutting Motor Car Company, Jackson, Mich., maker of Cutting cars, has become identified with the Keeton Motor Company, Detroit, maker of Keeton automobiles, as sales representative for New York State.

Ernest C. Cox, formerly connected with the Texaco Oil Company as sales manager, has been appointed manager of the eastern sales and service branch of the Findeisen & Kropf Manufacturing Company at 1902 Broadway, New York City, and will conserve the best interests of the Rayfield carburetor, made by that concern.

Gerald H. Murphy has severed his connection with the Splitdorf Electrical Company, Newark, N. J., maker of Splitdorf magnetos. As assistant treasurer for C. F. Splitdorf, Inc., for seven years, Mr. Murphy was known throughout the executive departments of the automobile industry. He announces no plans for the future.

A. J. Diefenderfer has been appointed manager of the New York branch of the Lozier Motor Company, Detroit, maker of Lozier pleasure cars. He was formerly assistant manager under W. J. Mead, whom he succeeds.

Col. Kirby C. Pardee, a veteran in the automobile business, has taken the New York agency for the Inter-State cars and has established headquarters at Broadway and 61st street.

John W. Paddon, formerly of the Paddon Motor Company, Boston, who has been at Portland, Ore., for the past year, has returned to Boston to engage in the second hand car business, selling pleasure and commercial vehicles. Temporary quarters have been secured at 293 Northampton street. Negotiations are being made for the construction of a garage capable of housing 75 machines.

E. F. Kalkhof is presented in an accompanying illustration. He is advertising manager of the Invader Oil Company, 80 Broad street, New York City, which recently took over the business of Chas. F. Kellom & Co., maker of Invader lubricants. Mr. Kalkhof has a wide and very successful experience in this line of endeavor, and his copy, while advertising manager of the Havoline Oil Company, and later of the Wolverine Lubricant Company, was of such character as to make him extremely well known in the industry as a publicity man. It will be remembered that T. E. Tomlinson, who helped to organize the Wolverine concern and has been for a number of years a decided force in the automobile lubricant field, is now vice president and general manager of the Invader company. Mr. Kalkhof has been associated with Mr. Tomlinson for a number of years and received his training under that leadership.

E. F. Kalkhof, Advertising Manager, Invader Oil Company.

NEW AGENCIES.

The Palmer & Singer Manufacturing Company, New York City, maker of Palmer-Singer cars, has closed contracts for the following agencies: Harry A. Clapp, Boston, Mass.; Mason's Garage, Newburg, N. Y.; Mechaley Auto Company, Stamford, Conn.; Maritime Motor Car Company, Vancouver, B. C.; W. P. Lathrop, Louisville, Ky.; Boye & Emmes Auto Company, Cincinnati, O.; Southern Tier Motor Company, Elmira, N. Y.

The Sidney B. Bowman Company, New York City, which handles the Marmon line, has taken on the Vulcan truck, designed and made by the Driggs-Seabury Ordnance Corporation, Sharon, Penn. F. Shepherd Parkin, formerly in charge of the Philadelphia branch of the Driggs-Seabury company, has joined the Bowman company.

The Jones Garage Company, Meriden, Conn., has taken the agency for Reo cars, and will handle that line in addition to its old lines, the Ford and White.

The E. B. Newton Auto Company, 649-651 Cass avenue, Detroit, has closed a contract with the Havers Motor Car Company, Port Huron, Mich., to handle the Havers line in and around Detroit.

The Borland-Grannis Company, Chicago, has announced the appointment of William C. Little as sales manager. Mr. Little is well known throughout the industry through his connection with the sale of both electric and gasoline machines. For several years he was special representative for one of the large manufacturers of electrics, and as such was called upon to take long trips, by reason of which he became well acquainted with a large number of dealers in every section of the United States. For some time past Mr. Little has been connected with the Lozier Motor Company, Detroit, maker of Lozier gasoline cars. With this concern he was a special representative in the sales department, and it was found that his former experience was of decided value in that position. There appears to be little doubt that in his appointment as sales manager of the Borland-Grannis Company, the maker of Borland electrics has secured an exceedingly valuable man.

W. C. Little, Sales Manager, Borland-Grannis Company.

The Pioneer Motor Truck Corporation, San Francisco, Cal., has closed a contract with the General Motors Truck Company, Pontiac, Mich., for the distribution of the G. M. C. trucks in the six Pacific coast states, the Hawaiian Islands and British Columbia, for a period of five years. It is said the Pioneer concern guarantees to purchase a minimum of $7,500,000 worth of trucks during this period.

The Marion Motor Sales Company, St. Louis, Mo., of which R. B. Ford is the head, is a new concern formed to handle Marion cars in the southwest. The company is a continuation of the Maxwell Automobile Company and for the present the salesrooms will remain at 308 North 12th street.

The Lewis Automobile Company of 4108 Olive street, St. Louis, Mo., has taken the agency for the Adams trucks, which are made by the Adams Bros. Company, Findlay, O.

The J. L. Bender Company, Chicago, distributor of Keeton cars and the Church electric, has also added the King car to its line.

The Stewart Motor Corporation, Buffalo, N. Y., maker of Stewart light delivery trucks, has appointed the following additional agents: Ontario Motor Car Company, Toronto and Ottawa, Can.; E. L. Jordan, Auburn, Me.

The Brown Commercial Car Company, Peru, Ind., maker of Brown trucks, has designated the following distributors: Engles Motor Company, Newark, N. J.; J. Fred Wilcox & Co., Joliet, Ill.; F. B. Price, Elizabeth, N. J.; South Brooklyn Auto & Livery Sales Company, Brooklyn, N. Y.; Norwalk Motor Car Company, New York City; Brown Car Corporation, New York City; Ritter Automobile Company, Madison, Wis.

The Hollander Motor Company, Boston, has closed a contract for the Boston agency of the Cartercar machines, made by the Cartercar Company, Pontiac, Mich. The acquirement of the exclusive rights to sell this car in this field means a greatly increased volume of business for that firm.

The Motor Parts Company, 185-187 Columbus avenue, Boston, has been appointed distributor for the products of the Bosch Magneto Company, New York City, maker of Bosch magnetos. A complete stock of magnetos, spare parts, spark plugs and other Bosch products will be carried in stock. F. W. Wilkening will be in charge of the Boston store, which is a branch of the Motor Parts Company of Philadelphia, Penn.

The Union Automobile Company, Wheeling, W. Va., is a new concern organized to handle the Abbott-Detroit cars, made by the Abbott Motor Company, Detroit. William F. Shaffer, secretary and treasurer of the Packers Motor Truck Company of the same city, was one of the organizers. Others were A. C. Shaffer, George P. Folmar, Albert M. Schenk.

The Cole Motor Car Company, Indianapolis, Ind., has appointed the following distributors: F. A. Wilson, Amherst, N. S.; J. P. Krall, Avon, S. D.; Davis Sparger Auto Company, Bristol, Tenn.; A. V. Hunt, Clarinda, Ia.; Lafayette Motor Car Company, Easton, Penn.; Swanson Bros., Lyons, Neb.; T. C. Maben, Northfield, Minn.; Pink, McVerty, Blackburn Company, Ottawa, Can.; C. Williams & Bros., Poplar Bluff, Mo.; Chamberlain Bros., Salem, Ore.; Trenton Motor Car Company, Trenton, N. J.; Buehr Bros., Wadona, Minn.; Morgan & Williams, Warren, O.

The Moon Motor Car Company, St. Louis, Mo., has appointed the following agents for Moon cars: Harry T. Erpenback, Atlantic City, N. J.; Dunham Auto Company, Brooklyn, N. Y.; Central Iowa Motors Company, Des Moines, Ia.; Tri-State Automobile Company, Minneapolis, Minn.; Montclair Garage & Machine Company, Montclair, N. J.; Sheely Motor Car Company, Passaic, N. J.; Reetz & Brown, Presho, S. D.; Fred H. Van Dorn, Red Bank, N. J.; Hessinius Auto Company, Sioux Falls, S. D.; Tabor Mercantile Company, Tabor, S. D.; Clifton Auto Company, Union Hill, N. J.; Moon Motor Car Company, Washington, D. C.

The R-C-H Corporation, Detroit, maker of R-C-H cars, has designated the following agents for its product: G. Van Arsdale, Deer Lodge, Mont.; D. R. McKinney, Durango, Col.; C. W. Workman, Evart, Tex.; George B. Doyle, Lafayette, Ind.; Zwick Bros., Lake City, Minn.; Gadbois & Greenwood, Littleton, N. H.; R. W. Method, Milford, Ind.; J. Harry Schumacker & Co., Philadelphia, Penn.; James H. Maize, Jr., Redlands, Cal.; Miller Paulson, Redwood City, Cal.; Oliver B. Whipple, Saginaw, Mich.; E. C. Bigelow, San Diego, Cal.; Bert Snyder, Victor, Col.; Ernest R. King, Waltham, Mass.

L. M. Vordemberge Motor Company, Baltimore, Md., and the Pathfinder Motor Car Company, Minneapolis, Minn., have taken the agency in their respective territory for the Pathfinder cars, made by the Motor Car Manufacturing Company, Indianapolis, Ind.

The Kissel Motor Car Company, Hartford, Wis., maker of KisselKar pleasure cars and trucks, has appointed the following distributors: Brooks Auto Company, Turlock, Cal.; F. H. Davis, Placerville, Cal.; Geyer & Boroski, Colusa, Cal.; J. S. Gill, Pleasanton, Cal.; W. W. Head, Chico, Cal.; W. J. Booth, Lebanon, Ore.; C. R. Canfield, Willamina, Ore.; John Gray, Roseberg, Ore.; E. E. Leas, Oakland, Ore.; W. J. Benbenick, Bremerton, Wash.; G. A. Thomas, White Salmon, Wash.; B. N. House, Cle Elum, Wash.; McGhee Auto Company, Kent, Wash.; Hugo A. Gutenkunst, Owen Sound, Ont.; Morrin-Thompson Company, Phoenix, B. C.; J. F. Austin, Monterey, Mexico; C. R. Miller, Stockholm, Sweden; Saskatchewan Garage, Moose Jaw, Saskatchewan; B. E. Munson, Crow's Landing, Cal.; E. T. Neal, Paso Robles, Cal.; W. A. Platt, Mt. View, Cal.; T. W. Thomson, Santa Cruz, Cal.; F. O. Taylor, Ukiah, Cal.; Wisnom-Bonner Hardware Company, San Mateo, Cal.; F. M. Wyatt, Winters, Cal.; Western Auto Supply Company, Reno, Nev.; Elko Auto Company, Elko, Nev.; McCoy & Veazie, St. Helena, Ore.; S. A. Mills, New Berg, Ore.; Newmith Auto Company, Cottage Grove, Ore.; C. L. Rose Company, Salem, Ore.; A. Wilhelm & Sons, Monroe, Ore.; J. J. Wirtz, Forest Grove, Ore.; Ernest Peterson, Mt. Vernon, Wash.; M. M. Stewart, Aberdeen, Wash.; Twin City Auto Company, Chehalis, Wash.; Yakima Auto & Supply Company, North Yakima, Wash.; Knueppel & Ott, Davenport, Ia.; Barre KisselKar Company, Barre, Vt.; Johnson & Stevens, Booneville, Mo.; Hedge's Garage, Greenpoint, N. Y.; Edward J. Deasy, Glen Cove, N. Y.; Hackensack Auto Service, Hackensack, N. J.; O. R. Hukle & Co., Lexington, Ky.; Chandler & Hightower, Ft. Worth, Tex.; Boulevard Garage, Bridgeport, Conn.; Taximeter Auto Company, Paterson, N. J.

The following are some of the recent agency contracts closed by various concerns in the country and the cars they will handle: A. Trust Poehlmann, Baltimore, Md., Stoddard-Dayton; Westcott Motors Company, Boston, Westcott; Clifford Alexander, Bradley, S. D., Detroiter; Samuel Hirtz, Bucyrus, O., Hudson; Mutual Motor Car Company, Buffalo, N. Y., Westcott; National Motor Car Company, Chicago, Garford; Charles Ross, Columbus, O., Great Western; Central Motor Car Company, Canton, O., Cartercar, Studebaker; Lyen, Christianson & Swanson Company, Des Moines, Ia., Regal; J. I. McFarland, Lodi, Wis., Studebaker; Williams Auto Sales Company, Indianapolis, Ind., Jackson; Arenz-Weihaupt Auto Company, La-Crosse, Wis., Marathon, Detroiter; J. I. McFarland, Lodi, Wis., Ford; Gage Automobile Company, Logan, O., Hudson, Ford, Overland; J. J. Caffrey, Louisville, Ky.; Mc-

Farland, M. C. Westfall, McArthur, O., Ford; J. M. Biddison, Milwaukee, Wis., Case; Barclay Automobile Company, Minneapolis, Minn., King; Rivet Motor Garage Company, Montreal, Can., Cartercar; C. W. Doheny, Montreal, Ohio; Universal Electric Company, Montreal, Buffalo; Stockwell Motor Car Company, Montreal, Standard; Provincial Motors, Ltd., Montreal, Locomobile; John V. Metz, Norwalk, O., Mitchell, Paige, Hupmobile; J. E. Snable, Norwalk, O., Detroiter; Westcott Motor Sales Company, Pittsburg, Penn., Westcott; Norman DeVaux, San Francisco, Cal., Little, Chevrolet; Lamping & Garfield, Seattle, Wash., Flanders; Hiter-Logan American Sales Company, Shelbyville, Ky., American; W. R. Shaw, Syracuse, N. Y., Alco; Syracuse Garage, Syracuse, N. Y., White; Syracuse Motor Car Company, Syracuse, N. Y., Paige; Charles G. Hanna, Syracuse, N. Y., Cutting; A. L. Bowen, Van Wert, O., Hudson.

The Michigan Motor Car Company, Kalamazoo, Mich., is planning to build a five-story office building to include a large concrete garage, dining room, library and other features, at a cost of $250,000.

PROPOSED NEW GARAGES.

W. H. Johnson, proprietor of the Windsor Hotel garage, Cedar Rapids, Ia., has awarded a contract for the erection of a new garage at 114-116 North First street.

The Western Automobile Company, St. Paul, Minn., has plans for a garage at Rice and Fuller streets to be modern in every particular.

The New York Sales Company, Binghamton, N. Y., has purchased large lots fronting 52.5 feet on both Collier and State streets and having a depth of 173. A ground floor garage to cover the entire plot will be erected at a cost of $35,000.

Black's Garage Company, New York City, will build a garage on the north side of 64th street, to cost $10,000.

The Beloit Auto & Machinery Company, Beloit, Wis., has plans for a garage to be equipped with modern machinery.

The Intersection Garage Company, Milwaukee, Wis., will erect a $10,000 garage on North avenue, near 12th street.

The Swaney Auto Company, Des Moines, Ia., will build a garage on West Sixth street, to be ready for occupancy by July 1.

A. Ehrbar, Cleveland, O., has plans for a new garage to be erected soon.

J. F. Grace, vice president and treasurer of Housum, Grace & Co., Cleveland, O., has awarded the contract for the erection of a modern garage to E. J. Andrews.

William F. Kees, Lakewood, O., contemplates building a new 1.5-story garage, 30 by 16 feet.

F. Wooling, Indianapolis, Ind., is having plans prepared for a large one-story garage.

C. K. Atlass, 509 North Ninth street, Lafayette, Ind., will soon erect a new garage.

Thomas Seeds, Jr., and F. B. Davis, Philadelphia, Penn., are estimating on plans for a two-story garage and stable at 6811 Quincy street for C. L. Betz.

William Dolpke, Canal and Main streets, Cincinnati, O., has plans under way for a garage.

The Radel Auto & Carriage Company, 652 State street, Cincinnati, O., will build a one-story garage to cost $15,000.

Charles Seibold, Alton, Ill., has announced his intention of building a one-story garage in that town this spring.

John P. Indorf, 160 St. Ann's street, New York City, has plans for a two-story garage to be 50 by 100 feet and to cost $20,000.

Anton Charvat, Chicago, contemplates building a one-story garage in a short time.

S. E. Arnold, Chicago, has let the contract for a new garage to the Moraw Building Company, 127 North Dearborn street.

William P. Clancy, 5539 South Green street, Chicago, has let the contract for a new garage.

A. E. Sward, 5142 Ellis avenue, Chicago, is asking for bids for the erection of a one-story garage.

William O'Connor, Milwaukee, Wis., is planning a garage, store and flat building, four stories high, with basement, to cost $80,000.

William H. Pueping, Fond du Lac, Wis., has announced that he will build a two-story garage to cost $25,000.

The O'Donovan Place Garage Company, South Omaha, Neb., is erecting a one-story brick garage at a cost of $6500.

J. A. Hutchinson, St. Louis, Mo., has plans for a two-story automobile supply house.

Mrs. Virginia P. Johnson, 2002 Linwood avenue, Kansas City, Mo., contemplates building a two or more story garage and business building at a cost of $25,000 as soon as losses are adjusted as a result of a recent fire.

Judge August Kassebaum, Clayton, Mo., has let the contract for the building of a two-story garage to cost $4000. The building will be at Maltese, Mo.

A. H. Beardsley, Elkhart, Ind., is to build a one-story garage and salesroom, 40 by 60 feet. The building has been leased to the Ford Automobile Company, Goshen, Ind.

J. W. Rodgers, Logansport, Ind., has let a contract for a one-story garage and work will be started soon.

J. C. Truett, Lagrange, Ga., has plans under way for a two-story garage, 40 by 70 feet, to cost $4500.

C. M. Wallace, Huntington, W. Va., is contemplating a new one-story garage.

J. P. Walter, Palmer House, Culver, Ind., is planning a two-story garage to accommodate 20 machines. Sleeping quarters will be included in the building for the employees.

W. P. Brown, Coffeyville, Kan., will remodel the first floor of a business block into a modern garage.

E. Morris, 421 Campbell street, Wichita, Kan., has started work on a one-story garage. The foundations of the structure are such that additional stories can be added. The building has been leased to George W. Denton, who will conduct a general automobile business.

Edward M. Dale has let the contract to David McCrock, Flourtown, Penn., for alterations and additions to a one-story garage, to cost $3000.

The Ideal Garage Company has let the contract for a substantial addition to its garage at Frederick, Md.

Judge Wheeler McGee, Louisville, Ky., has awarded the contract to the Alfred Struck Company for a two-story garage. There will be two buildings, one 78 by 200 feet and the other 60 by 200 feet. Both have been leased to the Southern Motors Company, 900 South Third street.

Myerscough & Buchan, Andover, Mass., has plans in progress for a one-story public garage.

L. B. Sanders, shown in an accompanying illustration, has been appointed sales manager of the Abbott Motor Company, Detroit, maker of Abbott-Detroit cars. For the past two years he was sales manager of the Lion Motor Car Company, Adrian, Mich., and was responsible in a large degree for bringing that company to the front. After the destruction of its plant by fire Mr. Sanders was actively engaged in the company's re-establishment until the project was abandoned in December. Previous to his connection with the Lion company, Mr. Sanders had held important sales positions with the United States Motor Company and the Reliance Motor Truck Company. Prior to the last named connection he conducted a thriving garage and sales business in New York City. While still a young man he has had a very wide business experience and is recognized as a man of decided executive ability. He is constructive in his methods and has a firmly established record as a business producer.

L. B. Sanders, Sales Manager, Abbott Motor Company.

Hawthorne Development Company, Paterson, N. J., will make alterations to its garage to cost $6000.

George S. Couch, Charleston, W. Va., has plans for a garage and flat building. It will be two stories high with basement and will cost $2500.

Stanley Ashbrook, Fort Mitchell, Ky., has let the contract for his new one-story garage.

B. H. Kroger Grocery & Baking Company, Cincinnati, O., is having plans prepared for a two-story garage, 150 by 200 feet, which will cost $50,000.

J. E. McLaughlin, 52 Howard avenue, Utica, N. Y., is having part of a residence building recently purchased at Clinton, N. Y., converted into a garage at a cost of $4000.

The Adirondack Motor Car Company, Hudson Falls, N. Y., has let the contract for its new two-story garage, which will be 40 by 125 feet.

F. S. Prince, Mamaroneck, N. Y., has let the contract for a new garage to the Lincoln, Steele, Fleming Company, 17 Madison avenue, New York City.

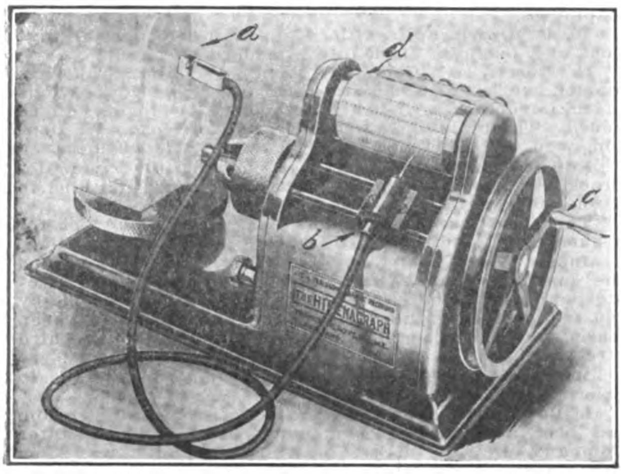
Edward C. Schagger, 190 Bowery, New York City, has awarded the contract for a two-story garage and greenhouse to be built at New Rochelle, N. Y.

The New York Transportation Company, 10 East 102d street, New York City, has let a contract for a three-story garage.

Cornelius N. Bliss, Jr., 14 East 36th street, New York City, is having plans prepared for a garage and stable to be erected at Wheatley Hills, L. I.

HITENAGRAPH, A DEVICE FOR TESTING IGNITION.

EFFICIENCY with multiple-unit internal combustion motors depends largely upon the synchronization of the spark. A device for testing and locating faulty operation of ignition systems is the Hitenagraph, announcement of which is made by Francis R. Hoyt of Cleveland, O. The name is derived from its function, that of creating a graphic record of the high-tension or secondary current.



The Hitenagraph, Designed for Testing High-Tension Currents, Magnetos, Etc.

The device is shown in an accompanying illustration testing a magneto for accuracy of performance. The Hitenagraph is simply constructed and its base is provided with a stand for mounting the magneto. The armature shaft of the latter is secured to the driving shaft of the testing device by a coupling similar in construction to the chuck of a drilling machine. The connection is so designed that the tapered shaft of the magneto may be held securely.

Rotating the driving wheel C revolves the armature of the magneto. The wheel is fitted with a handle, although its periphery has a V groove, permitting drive by a belt if desired. The drive is direct, there being no reduction. The chart drum revolves at an increased speed and the design is such that the spark index b which travels (through connection with a worm) longitudinally across the drum, is always diametrically adjacent, at the time the discharge should occur, to the ordinate on the chart itself on which the last produced spark registered. In this manner is shown, by the alignment of the sparks on the chart, the relative timing or synchronism of each cylinder. also the intensity of the spark by the area effected by it on the chemically prepared chart.

Two sections of the chart are reproduced herein, that marked A illustrating a typical case of lack of synchronism. The lines across the chart represent degrees of crankshaft rotation, or in other words, the chart as attached to the drum, is divided into 180 degrees and travels twice as fast as the magneto being tested. Each time the latter produces a spark, which is ordinarily twice a revolution or 180 degrees apart, the chart makes a complete revolution and each succeeding spark should fall on the same line of the chart as the one preceding it. In the illustration at A the record shows that the magneto is five degrees out of time. The difference in the size of the spark at retard and advance, is also indicated. At B is presented a record of the same magneto after being repaired and adjusted.

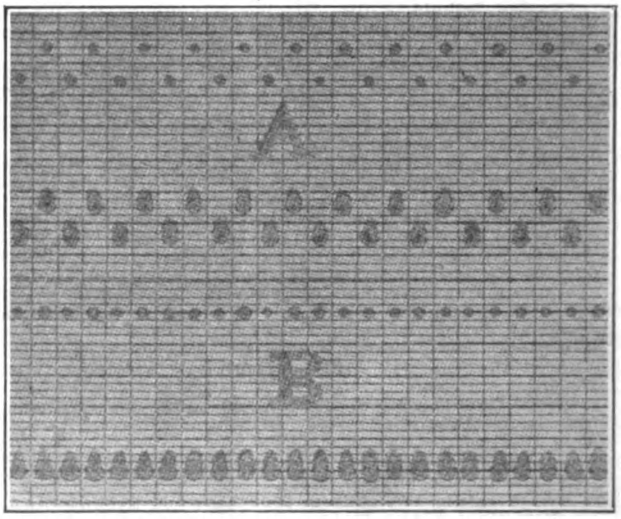
The Hitenagraph may be utilized for testing a magneto without removing the latter from the car, a smaller model being manufactured especially for garage service. The larger or bench model is for use in factories and it is stated that it will test 20 machines an hour. This latter design is equipped with a variable speed device, and a tachometer giving graphically the revolutions a minute.

NEW INSURANCE COMPANY.

Connecticut Concern Will Undertake to Assume Risks on Automobiles and Aeroplanes.

The Automobile Insurance Company, Hartford, Conn., has been organized under Connecticut laws with a capital of $2,000,000. The company is said to embody a new idea in indemnity and among its unusual powers will be authority to write policies on aeroplanes and automobiles and to cover them against every hazard, including fire.

The company assumes and revivifies the six-year-old charter of the Manufacturers Fire & Marine Company, which never was organized. Former United States Senator Morgan G. Bulkeley, president of the Aetna Life Insurance Company, secured the old charter. Associated with him will be John H. Hale, public utilities commissioner of Connecticut and several others well known in that state.



Chemically Prepared Chart Recording Lack of Synchronization at A and Proper Timing at B.

ANOTHER PERU FACTORY.

Will H. Brown Is Instrumental in Securing Accessory Concern for That City.

Through the efforts of Will H. Brown and the directors of his company, the Brown Commercial Car Company, Peru, Ind., the Crum-Wiley Manufacturing Company, which has been enjoying an increase of business the past year, has been induced to locate at Peru. The company will manufacture all automobile accessories made in brass, its specialty being grease cups and other small parts used in the building of motor vehicles.

Besides Mr. Brown, the directors of the new concern are: President E. L. Crum, Vice President Max Krauss, Secretary-Treasurer S. A. Shesler and J. R. Woodring. The company was formerly located at Decatur, Ill.

QUADRUPLED FORMER OUTPUT.

Annual Reports Show Business of Castle Lamp Company on Satisfactory Basis.

The annual meeting of the stockholders of the Castle Lamp Company, an Ohio corporation with its factory at Battle Creek, Mich., was held recently at Toledo, O., practically all the stock being represented. The reports of the officers were submitted and evidenced an improved condition of the company, the management of which was changed a short time ago. The concern is now a subsidiary of the Willys-Overland interests.

Under the new regime the output has been very much increased, being now four times what it was previously. The directors elected by the stockholders were: E. A. Williams, Jr.; Walter Stewart, Royal R. Scott, Rathbun Fuller and C. B. Mertz, who afterwards held a meeting and elected the following officers: President, E. A. Williams; vice president and treasurer, Walter Stewart; chairman of the board and secretary, Royal R. Scott.

FORMS CHAUFFEUR'S BUREAU.

New Haven Club Will Supply Members with Information Concerning Drivers.

The governing board of the Automobile Club of New Haven, Conn., has established a chauffeur's bureau, through which members will be supplied with information concerning men who are seeking employment. It is pointed out that the object is to enable chauffeurs to secure good positions, as well as owners to obtain satisfactory service.

Information as to the chauffeur's age, nationality, habits, etc., is filed by his employer, and provision is made for revising this from time to time as occasion requires. Members who desire employees are permitted to call upon the secretary for this information without expense.

CASE LEAVES LANSDEN COMPANY.

Succeeded by Blakesley, Giving Rise to an Entirely New Set of Consolidation Rumors.

W. L. Case, vice president and general manager of the Lansden Company, Newark, N. J., maker of Lansden electric vehicles, has resigned his position and his place has been taken by George E. Blakesley. It is understood that Mr. Case has disposed of his holdings in the company and will return to his consulting engineering practise after a trip through the South.

The Lansden Company was established about 10 years ago to develop an electric truck utilizing the Edison nickel iron batteries. After the International Motor Company took over the Mack plants at Allentown, Penn., a number of those interested in the latter business formed a syndicate to buy the Lansden Company, and it was taken over from Edison in January, 1912, when Mr. Case, who had a considerable part in the formation of the International company, was placed in charge.

Mr. Case's resignation would appear to set at rest rumors which have been circulated that the International company was to absorb the Lansden Company. That this supposition is without foundation seems to be further confirmed in the eyes of those interested, by the fact that Mr. Blakesley is said to be closely associated with John M. Mack, who although at one time a strong factor in the International company, has for the past few months been inactive in its management.

There is said to be some prospect of the formation of a new consolidation of the Lansden, the Mack and the Webb companies, all of which are owned by Mr. Mack and his associates. This possibility, however, has to date received no encouragement by those most intimately interested.

GOODYEAR INTERESTS INVOLVED.

Purchase Control of the Killingly Company, Engaged in Manufacturing Cotton Goods.

Interests identified with the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, have purchased the control of the Killingly Manufacturing Company, which has a plant at Williamsville, in the town of Killingly, Conn., for the manufacture of cotton goods. These men have entered the directorate, which has elected a new set of officers.

The official roster of the firm follows: President, Benjamin F. Smith of the B. F. Smith Construction Company, Pawtucket, R. I.; vice president, P. W. Litchfield, Akron, O.; treasurer, W. E. Palmer, Akron, O.; assistant treasurer, W. Irving Bullard, Danielson, Conn. These men and W. T. Teagan of Boston and A. M. Bannister of Providence, R. I., make up the new board of directors. Material improvements and additions to the plant will be made in the near future.

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MODERN BUSINESS METHODS.

The manufacturers are paying increasing attention to the dealers who handle their products and probably the reasons are not far to seek. There is no doubt that the future of the motor car industry lies with the dealers, since they come into direct contact with the purchasing public. Sharp practises that excited no comment in the early days of automobile building have become obsolete and a new standard is being established.

The dealers have become cognizant of their most pressing needs and have shown not only a desire to save the consumer money, but to give satisfactory service as well. It is to the interest of each that he have what the motorists want and it is therefore desirable that all kinds of suitable accessories be carried.

Without them trade will go elsewhere and it has too often been the case that stores having no connection with the automobile industry have carried accessories and reaped a good profit. This trade properly belongs to the garage and it is vastly preferable that a dealer concentrate his efforts upon a large volume of sales with small profits, than to be content with few sales carrying large returns. Without the former business the latter is likely to show a decided falling off. The dealer who applies system and modern merchandising methods to his enterprise rarely complains that his business is not meeting expectations.

THE COMMISSION EVIL.

One of the great evils with which automobile dealers have had to contend is that of paying commissions for names of prospective purchasers, supplied by their so-called friends. Quite frequently one such friend will furnish the name to all the dealers in his city, thereby assuring himself of a commission from whichever dealer the purchase is made.

The most effective way to meet this situation is in organization and this has been accomplished in some cities. The dealers must forget business rivalry, at least to the extent where they can unite to protect their own joint interests, and with a central bureau to give information upon request the commission evil would be quickly wiped out. In one city, when a prospect is given to a garage the name and commission offered is telephoned to the central exchange. Should this prospect be given to another dealer, he also telephones to the exchange and is immediately informed whether or not the name has been presented elsewhere.

In this way the scheme is discovered and the informant's attempt to get the dealers to bid against each other is effectually defeated. It would be well, perhaps, if all dealers would unite in absolute refusal to give commissions of any kind in return for such information, but if a commission is to be paid, a uniform rate should be fixed in order to avoid the pitfall of ruinous competitive bidding. The major profits of a sale must inevitably, under those circumstances, go to the third party to the transaction. The central exchange, where established, can also be utilized to provide confidential information to the dealers of the financial credits of those with whom they engage in business dealings.

The fuel problem promises to be uppermost in the minds of manufacturers and owners during the next few months. The discovery of the new fuel, motor spirit, does not seem to offer the complete solution that is expected. Those who read carefully between the lines cannot help but gain the impression that the practical kerosene carburetor is shortly to make its appearance, and on some of the best known cars. In fact, several such carburetors are said to have reached an advanced state of development and manufacturers are experimenting with them.

Mechanical Pointers for Garagemen and Repairmen

HOME MADE MICROMETER.

A micrometer is a very useful tool in the garage equipment as by it fine measurements may be made. One may be produced at a very small expense, says Popular Mechanics, and the tool will fill all requirements. The frame is cut from heavy sheet metal and of the shape depicted at Fig. 1 B, the ends being rolled over to form openings .25 and .375 inch outside diameter. A piece of brass tubing, .375 inch outside diameter and two inches long, is fastened securely into the larger opening. On the other end of this tube is brazed a nut tapped with a .25-inch tap, having 40 threads. The sleeve is made of another piece of tubing large enough to go over this nut. Next a bushing is fitted in one end of this sleeve and the other is beveled to about 45 degrees. The bevel is divided on its circumference into 25 parts, numbering every fifth graduation, beginning with zero.

A four-inch rod is threaded about half way to fit the nut and fastened in the other end of the sleeve with a bushing. The anvil is a piece of .25-inch rod fastened on the opposite frame opening, and allowed to project .5 inch inside the frame. Next the sleeve is run down until the screw comes in contact with the anvil and a mark is made on the stationary tube to register with the zero mark on the sleeve and at right angles to it. The sleeve is turned one revolution and another mark is made. This operation is continued until the caliper is opened to its full capacity. One complete turn of the sleeve represents 1-40 inch. One-twenty-fifth of a turn equals 1-25 of 1-40 or 1-1000. Half and quarter-thousandths can be estimated readily.

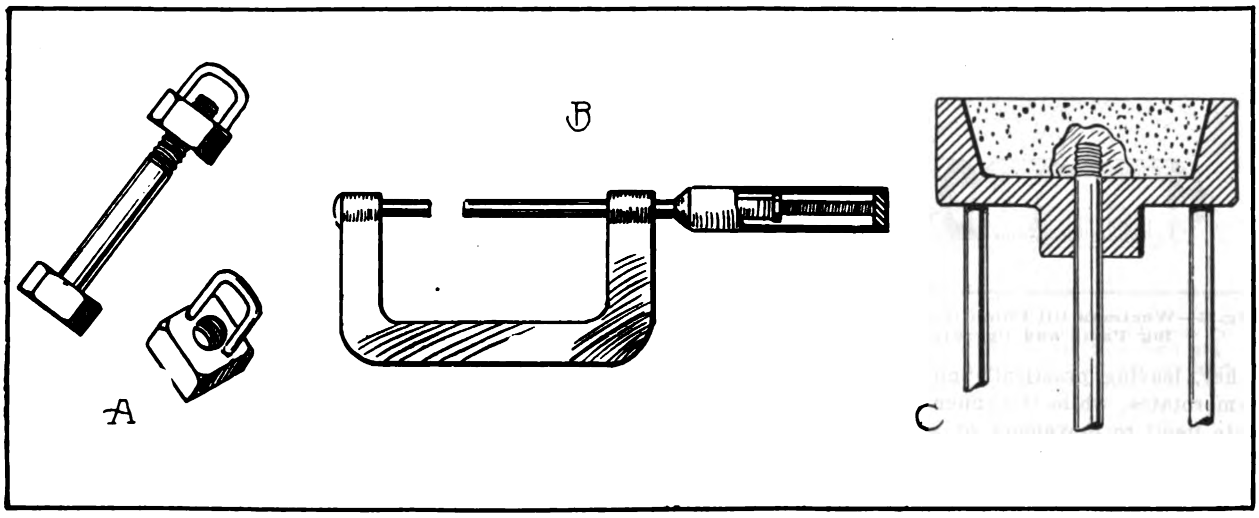


Fig. 1—Suggestions for the Repairman: A, Converting Ordinary Nuts into Wing Members; B, Inexpensive and Easily Made Micrometer; C, Method of Starting Stubborn Flywheel by Application of Molten Lead.

WING NUT KINK.

There are several places about the motor car where wing nuts would be desirable, as these members facilitate the removal and replacement of parts. A simple method of converting ordinary nuts into wing members is depicted at Fig. 1 A. It consists of drilling two holes in the nut and driving a staple through the openings, peining over the ends of the staple. The latter should be long enough to pass through the nut as well as to provide means for rotating it.

REMOVING STUBBORN FLYWHEELS.

A flywheel that has been shrunk on and keyed to a shaft presents difficulty in removal and when ordinary methods fail a recourse to heat must be made. At Fig. 1 C is presented a suggestion for removing the most obstinate members. It consists of two pieces of plank of a length slightly greater than that of the crankshaft. These are placed in a perpendicular position, with the flywheel resting on the top ends and the shaft hanging down between the braces.

A little clay is then packed around the end of the shaft as shown in the sketch, and the cavity in the wheel filled with very hot molten lead. If the shaft does not drop out under this treatment, a slight tap with a copper or lead mallet on its end will separate the two pieces.

SIMPLE SLOW SPEED OIL PUMP.

An oil pump with a minimum of moving parts, as well as being free from valves, springs or other similar mechanism, has been invented by G. E. Whetman, an English engineer. Among the features claimed for the device is that it will exhaust air and draw up oil from the start without the necessity of priming, and that all of its rotating parts practically constitute bearings of large surface, operating in a bath of lubricant.

The operating mechanism is exceedingly simple. At Fig. 2 is depicted a complete model and the intake sections will be noted on one side while the outflow is located on the opposite. Inside, the casing merely forms a cylindrical chamber, through which is a shaft driven from the engine. On this shaft, at each end of the chamber, are circular pieces of steel of such diameter as to be an oil floating fit in the pump chamber, but, while they fit in this compartment both on their circumference and at the outer end of the chamber, they are profiled on their inner ends so as practically to constitute side cams. The latter, at each end of the shaft, operate in conjunction with one placed between them in the centre of the chamber.

The outer cams rotate, though the centre member does not revolve but slides along a feather in the pump chamber so as to accommodate itself to the working of the two end cams as they rotate. This combination of sliding and rotating cams is such that in one position the profile of one fits against the other, leaving practically no space, but as the other cam rotates, while the inner cam can only accommodate itself to movement by sliding, it is obvious that the two will cease to fit into each other's profile, and space will occur between the two as soon as one begins to revolve. The position of this sliding cam is, therefore, so arranged that this space begins to open just opposite the intake in the casing, and thus oil is drawn in by suction to fill that space. Further movement finally shuts this space off from the inlet, and the oil filled space is then, by the revolution of the outer cam, transferred around the profile of the sliding cam to the delivery side of the pump. Moreover, the cam combination is so formed that, just as the oil filled space begins to reach a point opposite that of the delivery opening, the profile of the rotary cams again begins to butt up against that of the slider, so that the profiles of the two again tend to fit each other. This has the effect of squeezing the oil out from between the cams, and so force it through the delivery openings.

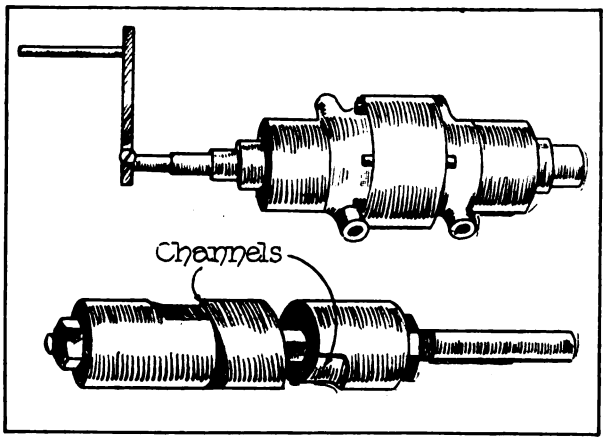


Fig. 2—Whetman Oil Pump Having a Minimum of Working Parts and Operating at Low Speeds.

The internal cam arrangement is also shown, and it will be noted that the divided line between the rotary and sliding cams does not lie absolutely opposite the intake and delivery openings, because space has been allowed between these for the use of a wrench on the union nuts, and therefore channels are cut on the rotary cams to connect the openings with the internal cam spaces.

The device is designed to be operated at slow speeds, the inventor pointing out that the shaft should not exceed 120 revolutions a minute. Tests developed the fact that at extremely low speeds, even at nine revolutions a minute, Vacuum A oil was pumped with excellent results.

ANNEALING SPINDLE PINS.

In replacing worn spindle pins with new members a repairman noticed that the threads of the part broke away at the slightest contact. A further examination of the bolt revealed the fact that the threaded end had been tempered too hard. Had the pin been utilized an accident might have ensued. The bearing portions of the pin were wrapped with a wet cloth and the temper drawn from the threaded end, and when replaced in the spindle gave efficient service. When these members have the appearance of being too highly tempered on the threaded end, they should be tested and the metal annealed.

FILTERING OLD LUBRICANTS.

It is surprising the amount of lubricating oil that is wasted in the average shop during the year and that more is not seen or heard of devices for economizing the lubricant. Many repairmen make it a practise when overhauling a car to throw away the old oil. In the course of a year this amounts to considerable and it could be saved if filtered properly. One owner of a shop who watches small details very carefully to keep down the overhead expense, devised a filter which, he states, proved practical and was the means of saving many gallons of oil during a season.

The device consists of a round tank, two ordinary tin funnels, waste, an extra vessel and some metal tubing. The tank holds several gallons and on the inside are soldered rings, these forming projections on the walls to retain the funnels. A fine mesh brass screen is fitted to the upper part of the container and so constructed as to be removed, this being necessary when the filtering material is renewed.

The bottom of the tank is drilled, a .25-inch copper tube soldered and led to a container. A pet cock is installed in the line so that the dripping oil may be shut off while the receiving member is being emptied or any part of its contents is being used. The waste is fitted loosely in the funnels and when the old oil is poured in at the top of the strainer the wire screen separates bits of metal and foreign elements. The fluid then passes to the first funnel, is filtered, and thence flows to the second member where the process is repeated. The oil resulting from the process is remarkably clear and the inventor of the device states that he employs it in his car where it has given satisfactory service.

TO HARDEN SMALL ARTICLES.

To harden small tools or articles that are likely to warp in the process, the following method is recommended: Heat the part very carefully and insert in a raw potato, then draw the temper as usual.

HEAT RADIATION AND PAINT.

It is generally believed that there is a great loss in efficiency from painting radiators. A series of experiments conducted by Prof. C. L. Norton of Boston upon the transmission of heat through and from painted surfaces shows that the color has little or no effect upon the radiation of heat, though the condition of the surface with respect to glossiness or dullness has quite a sensible influence. Taking the amount of heat radiated from a new pipe as 100, Prof. Norton obtains the following values for heat radiation, under similar conditions, from pipe which was treated as indicated in the table:

New pipe	100
Fair condition	116
Rusty and black	119
Painted dull white	120
Painted glossy white	100
Coated with cylinder oil	116
Painted dull black	120
Painted glossy black	101

It will be noted that a dull surface, whether it be white or black, has a radiative power of 120, and a glossy surface of either color, has a corresponding value of only about 101.

STRETCHING VALVE SPRINGS.

Sometimes the clattering noise of the valve mechanism is due to the weakness of the springs. When such a condition exists the best method is to fit new members. Sometimes an owner will object to the expense and the only alternative for the repairman is to renovate the old springs. This may be accomplished by removing and stretching the members, by securing one end in a vise and tying a cord to the other extremity.

Great care should be exercised, however, so as not to increase the tension to a point where the springs will close the valve with so much force as to break the stems. In addition, too stiff a spring consumes extra power.

Another method is to insert washers under the lower end of the spring.

VARNISH FOR COPPER.

An excellent varnish for copper and one that will prevent the metal from oxidization may be made by mixing one part of disulphide of carbon, one part benzine, one part oil of turpentine, two parts methyl alcohol and one part hard copal. Several coats of this mixture should be applied to the metal surfaces to be protected.

ANNEALING COPPER OR BRASS.

In fitting brass or copper tubing to the car when the material is not flexible it may split or crack in the operation. This may be prevented by annealing. Heat the piece to a dull red and plunge it in cold water. easily.

Care should be exercised so as not to heat the tubing too hot.

HOW TO SOFTEN FILES.

Occasionally a file will be purchased which upon trial is found to be tempered too hard and which tears the work. This trouble may be overcome by softening the tool. Cover the member with a thin coating of light oil and hold it over the fire until the lubricant blazes. As soon as the flame runs all over the file, it should be plunged into water.

FORMULAE AND USEFUL MECHANICAL TABLES.

Use of Water on Cutting Tool.

With the best high speed steel tools a gain of 16 per cent in cutting speed can be made in cutting cast iron, steel or wrought iron by throwing a heavy stream of water directly on the chip at the point where it is being removed from the forging by the tool. Not less than three gallons a minute should be used for a two by 2.5-inch tool. The gain is practically the same for all qualities of steel, regardless of hardness and whether thick or thin chips are being cut.

Lubricant for Milling Cutters.

An excellent lubricant for milling cutters when used with a pump is made by mixing together and boiling for one-half hour, one-quarter pound sal soda, one-half pint lard oil, one-half pint soft soap and water enough to make 10 quarts.

Grades of Emery.

The numbers representing the grades of emery run from eight to 120, and the degree of smoothness of surface they leave may be compared to that left by files as follows: Eight and 10, represent the cut of a wood rasp; 16 and 20, represent the cut of a coarse rough; 24 and 30, represent an ordinary rough; 36 and 40, bastard; 46 and 60, a second cut; 70 and 80, smooth; 90 and 100, a superfine; 120 F and FF, a dead smooth file.

Patching Cement.

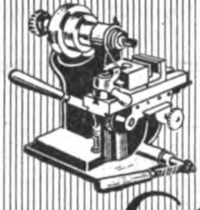
A cement for patching rubber boots and which will unite leather to leather, India rubber, etc., may be made by taking 100 parts of finely chopped India rubber, 15 parts rosin and 10 parts shellac, and dissolving in carbon disulphide. The vessel in which the solution is made should be kept tightly closed and should be shaken from time to time. Carbon disulphide is highly volatile and should not be exposed to a naked flame.

S. A. E. Horsepower Formula.

The standard formula for the rating of gasoline engines used in automobiles in this country is that adopted by the Society of Automobile Engineers, in which the bore is squared, multiplied by the number of cylinders and divided by 2.5.

The following table will be found to be of service in ascertaining the S. A. E. horsepower of four and six-cylinder motors, the bore being given in both inches and millimeters:

Bore		Horsepower	
Inches	Millimeters	Four-Cylinder	Six-Cylinder
2.500	64	10.000	15.0000
2.625	68	11.000	16.5000
2.750	70	12.100	18.2000
2.875	73	13.250	19.8750
3.000	76	14.400	21.6000
3.125	79	15.625	23.4375
3.250	83	16.900	25.4000
3.375	85	18.250	27.4000
3.500	89	19.600	29.4000
3.625	92	20.250	31.6000
3.750	95	22.500	33.7500
3.875	99	24.000	36.0625
4.000	102	25.600	38.4000
4.125	105	27.250	40.9000
4.250	108	28.900	43.8000
4.375	111	30.625	45.9375
4.500	114	32.400	48.6000
4.625	118	34.850	51.6000
4.750	121	36.100	54.1000
4.875	124	38.000	57.0000
5.000	127	40.000	60.0000
5.125	130	42.000	63.0000
5.250	133	44.100	66.2000
5.375	137	46.000	69.1000
5.500	140	48.400	72.6000
5.625	143	50.625	75.9375
5.750	146	53.000	79.5000
5.875	149	55.250	82.9000
6.000	152	57.600	86.4000



Up-To-Date Shop & Garage Equipment

SELECTING TOOL EQUIPMENT.

The small repair shop, and there are many of these, must always exist. Many owners of motor cars favor these establishments, because of the practical and skillful workmen, and the high class work performed at reasonable charges. This is due in a measure to the fact that the overhead expense is not as great as with the larger and completely equipped plant in the heart of the city.

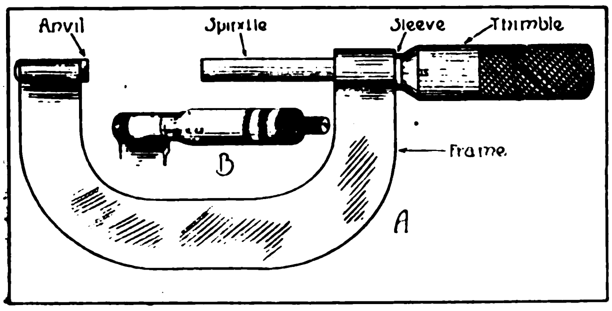


Fig. 1—Measuring Devices: A, Standard Form of Micrometer; B, Ratchet Stop.

These small shops usually make it a practise to send the greater portion of the machine work required to some outside firm, the amount of this depending largely upon the character of the work and the equipment of the garage. Some are fitted with a small foot lathe for light work while others are provided with better facilities for handling different grades.

In a thorough overhauling job there are more or less renewals to be made and some of these cannot be effected with new parts owing to their peculiar relation to one another. When the lathe is utilized to handle the piece, it is essential that the work be turned accurately and to accomplish this it is necessary that the operator be equipped with the proper measuring devices and have a knowledge of their use. It is the intention of the writer to present from time to time a description of the various tools needed to complete the equipment of the small garage, as well as to describe the uses to which they are adapted.

Micrometers.

Considering first the measuring devices: The workman should learn to understand thoroughly the necessity of close or accurate measurements. With the aid of a micrometer he will soon be able to detect differences in measurement down to one-thousandth of an inch. These instruments provide convenient as well as accurate means for fine external measurements and are made in different sizes and styles. They are graduated to read to thousandths of an inch, and one-half and one-quarter as well are estimated readily. Some of these instruments have verniers by which a still finer measurement may be made.

The chief mechanical principle embodied in the construction of a micrometer is that of a screw free to move in a fixed nut. An opening to receive the work to be measured, is provided by the backward movement of the screw and the size of the opening is indicated by graduations. A standard form is shown at Fig. 1 A, this tool enabling measurements up to one inch by thousandths.

Method of Use.

To use the micrometer the article to be measured is placed between the anvil and the spindle. The frame being held stationary, the thimble is revolved by the thumb and finger. The spindle being attached to the thimble revolves with it, and moves through a nut in the frame, approaching or receding from the anvil. The measurement of the opening is indicated by lines and figures on the sleeve and thimble.

The pitch of the screw threads on the concealed part of the spindle is 40 to an inch. One complete revolution of the spindle therefore moves it longitudinally one-fortieth or 25 thousandths of an inch. The sleeve is marked with 40 lines to the inch, corresponding to the number of threads on the spindle.

When the instrument is closed, the beveled edges of the thimble correspond with the line marked 0 on the sleeve, and the 0 line on the thimble coincides with the horizontal line on the former. If the micrometer be opened by rotating the thimble one full turn, or until the 0 line on the thimble coincides with the line of the sleeve, the distance between the anvil and spindle is .025 inch, and the beveled edge of the thimble will coincide with the second vertical line on the sleeve. Each of the latter indicates a distance of .025, and every fourth line is made longer and is numbered 0, 1, 2, 3, etc. Each numbered line denotes a distance of four times .025 inch or .1.

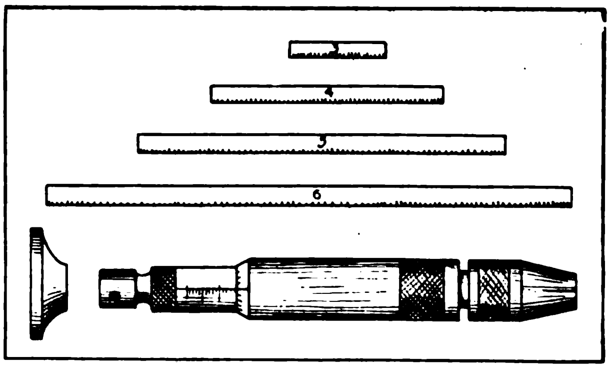


Fig. 2—Inside Micrometer Gauge for Making Internal Measurements, Such as Rings, Cylinders, Etc.

The beveled edge of the thimble is marked in 25 divisions, and every fifth line is numbered, from 0 to 25. Rotating the thimble from one of these marks to the next moves the spindle longitudinally one twenty-fifth of twenty-five thousandths, or one thousandth of an inch. Rotating it two divisions indicates two thousandths, etc. Twenty-five divisions will indicate a complete revolution, .0125 inch.

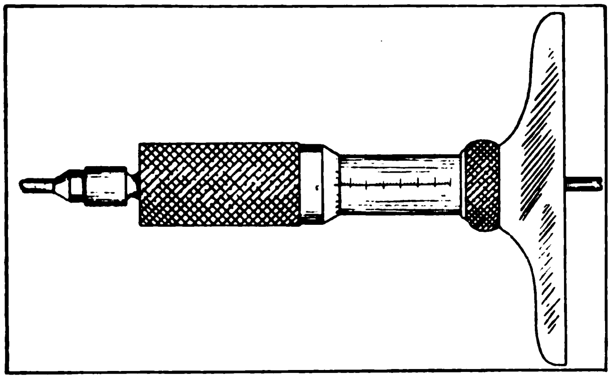


Fig. 3—Depth Gauge, Employed for Measuring Holes, Grooves and Irregular Parts.

To read the micrometer: Multiply the number of vertical divisions on the sleeve by 25, and add the number of divisions on the bevel of the thimble, from 0 to the line which coincides with the horizontal line on the sleeve. For example: If there are 10 divisions visible on the sleeve, multiply this number by 25, then add the number of divisions shown on the bevel of the thimble, which is 10. The micrometer is therefore opened 10 × 25 = 250 + 10 = 260, or 260 thousandths.

Ratchet Stop.

At B is depicted a ratchet stop. When using this device the ratchet slips by the pawl when more than a certain amount of pressure is applied, thereby preventing the measuring spindle from turning farther and perhaps springing the instrument. It is adaptable where a number of measurements must be taken quickly and especially where they are taken by more than one person with the same device, as by its use the same amount of pressure is applied to the article to be measured, in every case.

Inside Micrometer Gauges.

The inside micrometer gauge shown at Fig. 2 is designed for making internal measurements, such as rings, cylinders, setting calipers, comparing gauges, etc. It is also well adapted for measuring parallel surfaces. It consists of a holder provided with a micrometer screw and thimble, and the former has a movement of .3 of an inch. By the use of the extension rods, measurements from three to six inches may be made by thousandths. The extension member varies by inches, and should be readjusted only when the points have become worn.

Depth Gauge.

The gauge depicted at Fig. 3 is utilized for measuring the depth of grooves, holes or irregular parts. It has a one-half inch movement of the screw, reading in thousandths, and with two one-half inch and one one-inch standard collars to slip off or on the spindle 2.5 inches, readings in thousandths may be obtained. The split nut is covered and protected by a graduated sleeve, which not only protects the nut from the dirt, but provides a quick and accurate way of taking up wear and adjusting the device to insure correct reading. The sleeves being held by stiff friction, may be rotated with a spanner wrench, so that the zero lines will always coincide for correct reading. The head carries with it a knurled set screw for locking the spindle which serves to prevent changing after being set.

Other Measuring Devices.

In equipping the shop with measuring devices, calipers should not be overlooked as these tools are very essential. They are made in several forms and are not expensive, although in purchasing these members it is poor economy to select cheap instruments.

Those shown at Fig. 4 A may be used either plain or with a spring nut. The device depicted at C is an inside transfer caliper and may be obtained either with a spring or a solid nut. The bow is stiff, making the instrument reliable. It is especially adapted for calipering the inside of a chambered cavity and this is accomplished by springing in the legs so that the tool may be withdrawn. Upon releasing the grip the legs will spring back to their original position, showing the exact size of the opening calipered.

Adjustable Firm Joint Calipers.

The calipers shown at B are made in various sizes and can be instantly adjusted to their full extent, as quickly locked firmly in the joint, and are fitted with means for making a sensitive adjustment. These are an improvement over ordinary forms inasmuch as they are made with a tapering socket joint, locked or released by a partial turn of the knurled disc drawing it together. A spring washer which is fitted under the disc maintains an easy friction in the joint when it is unlocked.

In the underside of the short arm is a slot containing a stiff spring. Riveted into the middle leg and projecting through an opening in the arm, is a threaded stud on which is a knurled nut having a beveled hub, bearing against the cone in the arm. The action of the spring holding them together turns the nut, presses them apart and adjusts the legs when the point is locked. As the spring takes up all backlash the legs consequently are firm.

Calipers of Conventional Type.

Calipers of the ordinary type, yet having a well constructed joint, are illustrated at Fig. 5 A. The joint is drawn together by means of a screw and the main stud is squared and fitted to one leg, thus preventing the former from turning when loosening and tightening, insuring a smooth and more uniform friction and more or less tension to suit the user. Screw thread calipers are similar to the members depicted at Fig. 4 with the exception that the points are constructed to fit the threads to be measured.

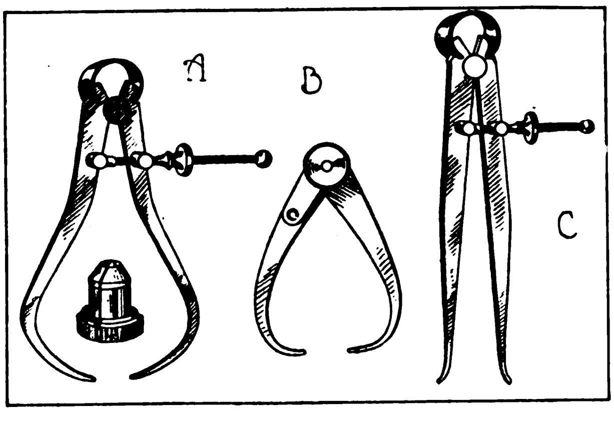


Fig. 4—Some Measuring Devices: A, Calipers; B, Adjustable Firm Joint Members; C, Inside Transfer Calipers.

Regarding gauges, these are optional and will depend on how complete the equipment is to be made. For accurate work with twist drills, and when these members are constructed in the shop, a gauge such as shown at Fig. 5 B will be useful. This provides means for measuring the members in sizes from .25 to .5 inch in diameter. Each size of the drill is designated by both common fractions, also by decimals. Number drills from one to 60 are measured by a similar instrument and the size of each drill is given in decimal fractions. Gauges are also made for sheet metal and plates, standard wire, etc.

That shown at C is a screw pitch gauge and provides for measurement of a large number of different sized members. The teeth are sharp and clean cut, and can be used inside of a nut as well as on the outside of a bolt or screw. It also provides a convenient and reliable tool to use as a 60-degree centre gauge or to test the grinding of either an inside or outside threading tool.

A machinist's pocket scale or rule should be included in every equipment. These are constructed of steel and of different lengths and thicknesses. That illustrated at D is a conventional type and is graduated in inches or millimeters. At E is depicted a form of spring dividers with solid adjusting nuts and equipped with a small handle or twirler. A spring nut may be utilized instead of the solid members.

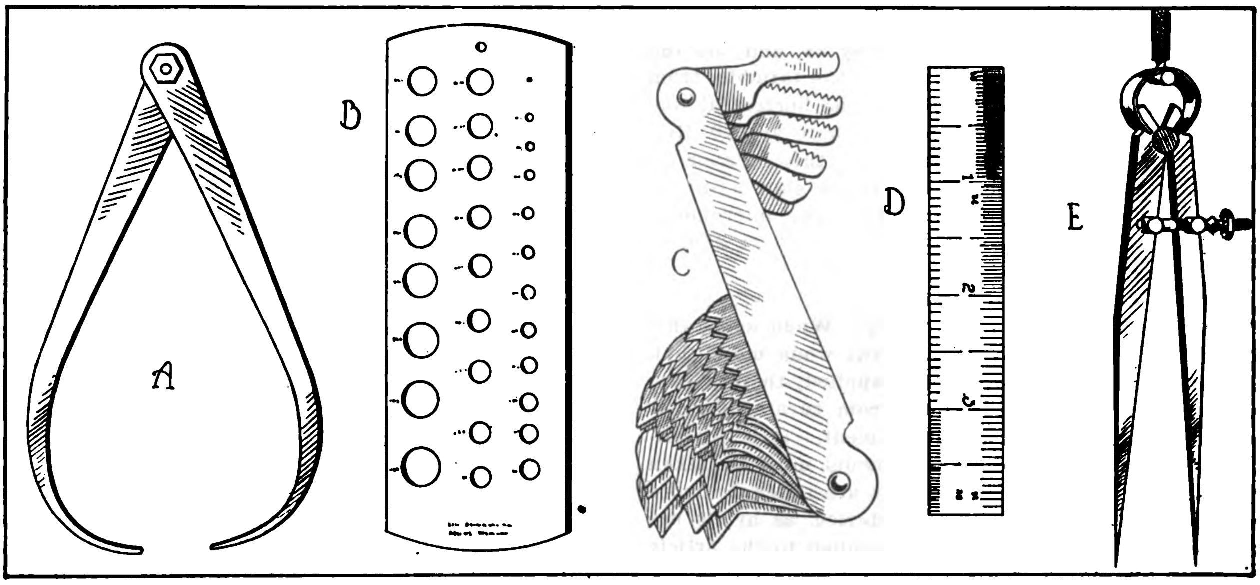


Fig. 5—Measuring Devices: A, Ordinary Form of Callipers; B, Twist Drill Gauge; C, Screw Pitch Gauge; D, Machinist's Steel Rule; E, Spring Dividers.

PROPER CARE OF CHAINS.

With the rapid development of the commercial vehicle a new branch of repairing is opened to the shop and the increasing number of mechanical transports will have a stimulating effect upon the garage. The progressive owner of the repair shop is already making preparations for this line of business and there is no reason why a well equipped shop should not be able to handle the work as satisfactorily as pleasure machines.

As the majority of the motor trucks utilize chains for final drive it is an excellent idea for the repairman to brush up his knowledge of sprockets and chains. Many workmen who graduated from the ranks of bicycle repairers will discover that their experiences with the chain driven mount will be of value.

The secret of a chain drive, aside from lining up the sprockets, etc., is proper lubrication. Chains should be removed from the sprockets and washed thoroughly in gasoline or kerosene, removing every particle of dirt. A mixture of beef or mutton tallow and flake graphite is prepared in a large receptacle and the ingredients heated over a fire. The chain is then placed in the vessel and boiled. Upon removal it should be hung up to cool. The tallow and mixture will penetrate to all crevices, filling these completely, making an ideal lubricant. Chains cared for in this manner will give efficient service.

USING TINNER'S SNIPS.

The proper use of tinner's snips requires considerable skill. These tools are not only more difficult to manipulate than a file, but far more dangerous, as if handled carelessly or clumsily the pointed blades may cause a dangerous cut to say nothing of pinched fingers. In cutting sheet metal considerable strength is required as well as skill, and experts utilize a peculiar action of the palm and thumb to open the blades after each cut.

The proper way to use these instruments is to hold the tool so that the upper handle rests against the palm of the hand and the thumb bridges the handle. The fingers are placed below the lower handle and the end of the thumb bears upon this handle just above the position of the index finger. Unless one is familiar with the use of the snips, and heavy material is to be cut, the safest and easiest method is to clamp one handle in the vise, on the principle of the stock shears, and work with the other by hand.

BALL BEARING LUBRICATION.

In assembling components of the car fitted with ball bearings some repairmen employ any kind of oil or grease, usually that which is the handiest. Makers of ball bearings state that the parts must be protected from the atmosphere and that the lubricant should be a small amount of light oil. The latter should be particularly efficacious against the action of water and one having a very small percentage of oleic acid. When the bearings are small, they should be lubricated with an oil recommended by the maker of these components.

LOCK NUT WASHER HINT.

A repairman was called on to fit some form of locking device to the bolts securing the flanged extension of the flywheel of the motor to a similar member of a planetary transmission. The owner complained that lock and other types of washers worked loose. The problem was solved easily by the workman who proceeded to take a piece of .0625-inch sheet metal which he cut to the size of the locking nut.

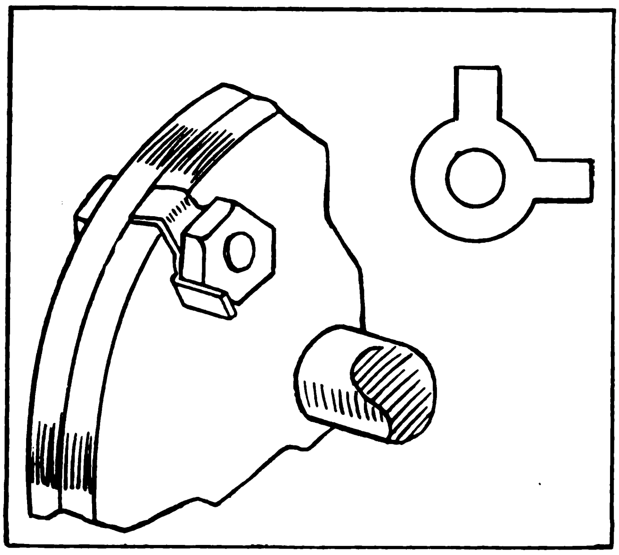


Fig. 6—Locking Device Constructed of Sheet Metal, Having Flanges to Prevent Nut from Turning.

Two arms or extensions were left on the metal and a hole drilled to fit the bolt. The device was slipped over the bolt and the nut screwed up tightly after which one of the ends of the attachment was bent over the flange of the wheel as depicted at Fig. 6, and the other projection bent to the face of the nut. This arrangement worked satisfactorily as the flange member on the nut prevented the latter from moving while the body of the washer was prevented from turning by the other extension gripping the rim of the wheel.

METHOD OF DRILLING GLASS.

Although the repairman is seldom called upon to make repairs to the accessories constructed of glass such as the windshield and lamps, the fitting of sight feed oiler tubes and dials requires a knowledge of how to handle glass, such as cutting, drilling, etc. Where a slight crack appears in a windshield further damage is prevented by drilling two small holes and fitting a device similar to that utilized on large store windows. It may be possible that an owner desires an opening cut in the windshield for use in stormy weather.

Glass may be drilled with a small tool by using turpentine as a lubricant, but this has its disadvantages inasmuch as the tool has to be resharpened frequently as well as that the diameter of the hole is apt to be larger at the top than at the bottom, also it is difficult to drill holes of equal size.

Drilling may be accomplished successfully by utilizing a brass tube of the diameter of the desired hole. The end of the pipe is trued up to secure an even bearing upon the glass and a small opening made in the side of the tube through which the abrasive is introduced during the process, this being done so that the tool will not have to be lifted during the work.

In starting the drill a piece of wood is utilized having an opening of the same diameter as the tube and the guide is attached to the work. The drill may be operated by a drill press or hand drill and during the operation the cutting paste may be fed to the tube by an oil can. If a sharp edged hole is desired, a thin piece of glass may be placed over the work and held in position by French copal varnish.

In fitting glasses to lamps, such as head or side members, if the circles be cut by the repairman the edges are likely to be jagged or rough. It is essential that the glass fit accurately and sometimes a trifle has to be removed. The rough edges may be smoothed by utilizing a bastard file kept liberally moistened with the following solution: Pulverized camphor, two ounces; sulphuric acid, six drams, and enough oil of turpentine to fill the remainder of a six-ounce bottle.

SPRING STEERING CONNECTIONS.

While provision is made in the modern car for the absorption of road shocks to the steering system, many of the older types are not thus equipped. A method of fitting a spring device to the reach rod connections as well as those connecting the steering mechanism was noted by the writer recently. The car was an old model and the steering connections were of the ball and socket type as outlined at Fig. 7. Considerable play existed which wear was taken out, and as the owner complained of these parts rattling the repairman devised the kink outlined in the drawing.

The screw bolt holes in the half to which is attached the rod, were enlarged slightly to remove the thread and a new bolt fitted, one having the thread cut up about half way from its end to the socket member. A stiff spring was placed over the bolt and a nut screwed on and up to obtain the desired tension. Cotter pin holes were then drilled and retaining members fitted as depicted in the drawing. The job was not expensive and reduced road shocks to a minimum as well as serving to eliminate objectionable rattling.

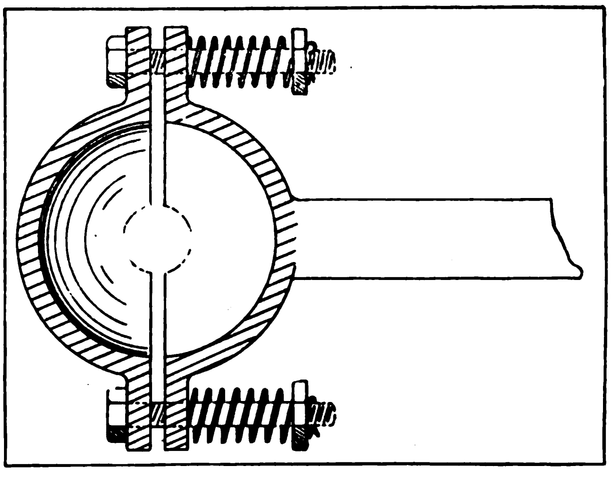


Fig. 7—Simple Method of Fitting Springs to Ball Socket Joints of Steering System.

Boxes of sawdust or fine sand are useful and should be included in the equipment of the garage, particularly as the material possesses absorbing qualities.

CORRESPONDENCE WITH THE READER.

Noting Battery Discharge.

(148)—To ascertain the condition of dry cells we use an ammeter. For testing storage battery cells a voltmeter is employed. We are told that the ammeter cannot be used for measuring the storage battery, yet we can use the voltmeter on dry cells. And I note that some lighting systems on cars using dynamos have ammeters on the dash. This point is not very clear to me and I should like to have an explanation. If the ammeter can be employed in lighting systems why cannot it be used with the straight storage battery system?

REASON.

Malden, Mass., March 30.

The use of an ammeter for testing dry cells by short circuiting it across its terminals for an instant, has proved sufficiently satisfactory for a continuation of the method. Because it is done it is difficult for the layman to understand why the same instrument is not applicable to the storage battery.

Some idea of the difference may be gained by remembering that the internal resistance of dry cells is comparatively high and the chemical action comparatively slow, while the chemical action of the storage battery is very rapid and internal resistance very low when its elements are connected, and that rapid chemical action is productive of heat. It should be borne in mind that in charging a storage battery a difference in potential between the plates (positive and negative), is created, and that if the plates were joined together the difference of potential would instantly become equalized. It is this process of equalizing that gives off the current making the battery useful. Thus it will be seen that it is desirable that the cells be discharged slowly.

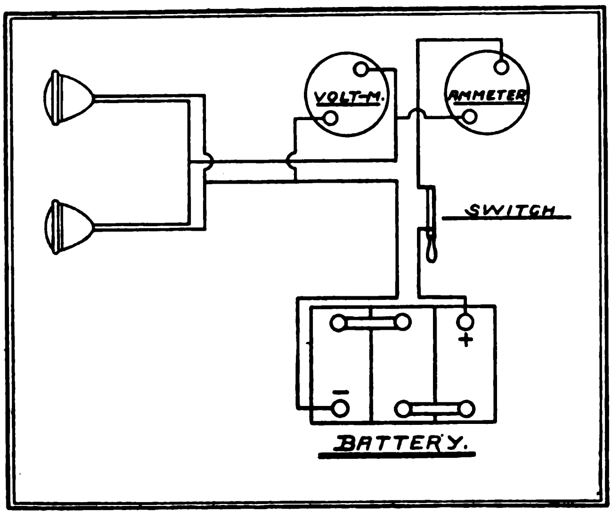


Fig. 1—Illustrating Use of Voltmeter and Ammeter in Straight Storage Battery System of Lighting.

An ammeter is of such low resistance that to all intents and purposes connecting it across the terminals of a storage battery would bring about practically the same conditions as connecting the plates directly. For this reason a voltmeter is employed because it has high resistance and requires practically no current to operate it.

Regarding the ammeters utilized in connection with dynamo lighting systems on automobiles, it will be noted that the maximum reading of the scale is from 15 to 20 and that provision is made for denoting the charge and discharge rates. These instruments indicate the amount of current being drawn from the cells, not their capacity.

Regarding the question as to whether an ammeter can be employed with the straight storage battery system, the diagram presented at Fig. 1 will show the method of incorporating both instruments in the circuits. In this installation the voltmeter would indicate the strength of the current and the ammeter the amount being drawn for heating the filaments of the lamps, which would be small in comparison with that capable of being supplied by the battery.

Irreversible Steering Gear.

(149)—Is the Ross steering gear for trucks of the reversible or irreversible type and how is the latter obtained? A. J. WHITMAN.

White Plains, N. Y., April 4.

The Ross Gear & Tool Company, Lafayette, Ind., manufactures two models of steering gears for commercial vehicles and both are of the irreversible type. The steering wheel is tapered and keyed to a tube, the lower end of which carries a steel screw, which when turned by the wheel gives a phosphor bronze sleeve longitudinal motion. The bronze sleeve, which is threaded to receive the screw, has spirals on its external face. These spirals have a very long lead in comparison to the threads on the steel screw. The malleable iron housing has spirals on its interior which engage the spirals on the bronze sleeve.

When the sleeve is given longitudinal motion by the steel screw, it also is given a rotative motion by the spirals on its exterior. The bronze sleeve, in addition to being interiorly threaded, contains a number of straight internal keyways. The lower steering arm, which projects half way up into the gear, has keys milled on its surface which fit keyways within the phosphor bronze sleeve so that when the sleeve is given rotative and longitudinal motion it operates the steering arm. The difference in pitch of the steel screw and the bronze sleeve causes the gears to be irreversible in their action.

T Head and L Head Motors.

(150)—What is the advantage, if any, of the T head type of motor over the L head design? Is either type more efficient than the other or more accessible for adjustment, repairing, etc.? INTERESTED READER.

Oswego, N. Y., April 2.

Among the advantages claimed for the T head type of motor is that its external components are accessible, such as the magneto, carburetor, water pump, etc. There are, however, many L type motors which are equally accessible as the T type and some are more easy to work upon. With the T type the valves are divided, the intake being on one side and the exhaust on the other. With the L type, the valves are all located on one side. With some designs of the latter type the valves are even more accessible than with some of the other design. Regarding efficiency as well as accessibility, it would depend upon their respective design and construction.

Specific Gravity.

(151)—I note reference made to specific gravity. What is it and how is it figured out? CURIOUS.
Newark, N. J., March 14.

The specific gravity of a substance is its weight as compared with that of an equal bulk of pure water. To ascertain the specific gravity of a substance, W = weight of body in air; w = weight of body submerged in water.

$$\text{Specific gravity} = \frac{W}{W - w}$$

If the substance be lighter than the water, sink it by means of a heavy substance, and deduct the weight from the heavier material.

Specific gravity determinations are usually referred to the standard of the weight of water at 62 degrees Fahrenheit, 62.355 pounds a cubic foot. Some experimenters have used 60 degrees Fahrenheit as the standard, and others 32 and 39.1 degrees. There is no general agreement.

Given specific gravity referred to water at 62 degrees Fahrenheit, to find weight a cubic foot, multiply by 62.355. Given weight a cubic foot, to ascertain specific gravity, multiply by .016037. With specific gravity known and weight a cubic inch desired, multiply by .036085.

Specific gravity is utilized in chemistry, and when the density of liquids, such as gasoline for example, is desired, an instrument known as a hydrometer is employed. It is usually made of glass and consists of three parts, an upper stem or fine tube of uniform diameter; a bulb or enlargement of the tube, containing air; and a small bulb at the bottom, containing shot or mercury. The last is for the purpose of making the instrument float in the liquid in a vertical position. The stem is graduated and the figures may represent either specific gravities, or the number of an arbitrary scale, as in Baume's, Twaddle's, Beck's or other hydrometers.. There is a general tendency to discard all hydrometers with arbitrary scales and to utilize only those which read in terms of specific gravity alone.

Focal Adjustment of Electric Lamps.

(152)—I have fitted a pair of electric lamps to my Ford car, but the light is not satisfactory; that is, it does not cover the road as well as did my acetylene lamps. What is the trouble and how can it be remedied? ELECTRICITY.
Cincinnati, O., March 17.

The trouble may be due to improper focal adjustment or the design of the lamp. It is possible that the former condition exists and it may be ascertained by changing the position of the lamp provided it is of the adjustable type.

Correct focal adjustment is very necessary for maximum service with electric headlights having parabola reflectors. In a gas lamp the position of the burner is usually fixed by the maker. With the electric units the manufacturer, as a rule, provides means for moving the bulb backward or forward.

Assuming that the point of travel is 1.5 inches; that is, from extreme rear position to the maximum front location. When the bulb is placed in the centre the geometrical focus of the paraboloid, for example, the reflected rays are parallel and a far reaching beam is produced. If the lamp be moved to the extreme rear point, the light rays will diverge and give more light to the side. When at the extreme front position the rays not only diverge, but cross in the process. The usual practise is to locate the focal length between .775 and 1.25 inches. Shorter focal lengths are prohibited because of certain mechanical requirements in incandescent lamps utilized.

In the case mentioned it would appear that the bulb is located too far forward and by moving it back slightly it may be possible to secure the light desired. One maker suggests the following simple method of adjusting the bulbs on the road: Place a newspaper about 100 yards from the car and adjust the position of the bulbs by means of the mechanism provided for this purpose, until the best illumination is obtained on the paper. Each lamp should be adjusted separately. This is advised as the filament of the bulbs will vary slightly. The moving of the bulb about .125 inch will make a considerable difference in the diffusion of the light.

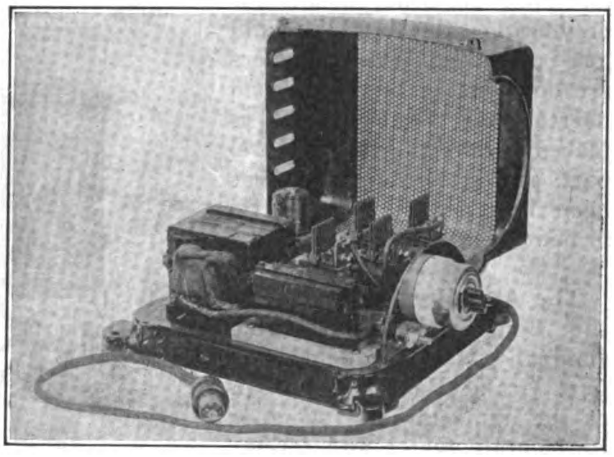


Fig. 2—Edison Alternating Current Rectifier, Adapted for Charging Storage Batteries.

Current Rectifying.

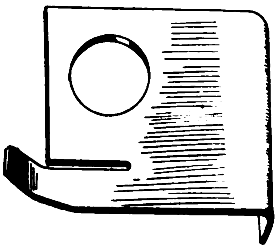
(153)—I understand that you printed an article on charging lighting batteries by an automatic rectifier. Can you give me information concerning the same and who is the maker of the device? F. A. B.
Jackson, Mich., March 17.

The article appeared in the November Accessory and Garage Journal and the instrument was an Edison alternating current rectifier which is presented at Fig. 2. It is made in two sizes, one providing a charging capacity of eight amperes and the other 16, and with the unit shown a regulating rheostat is provided. Complete information will be forwarded free of charge by the maker, Thomas A. Edison, Inc., Orange, N. J.

DESIRABLE ACCESSORIES FOR THE DEALER.

Descriptions of the Newest and Most Popular Lines Which the Up-to-Date Agent May Handle with Profit.

The Bartley Nut Lock and bolt fastener is the product of the Bartley Nut & Bolt Fastener Company, Pittsburg, Penn., and the maker holds that the device eliminates the use of double nuts, keys, cotter pins or other means for preventing the loosening and loss of nuts. The fasteners are constructed of mild open hearth steel. The device is placed between the nut and part, and after the former has been tightened the locking arm is bent easily into position.


BARTLEY NUT LOCK

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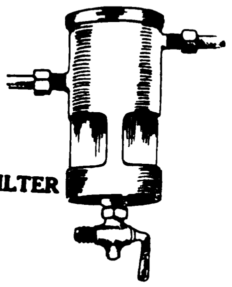
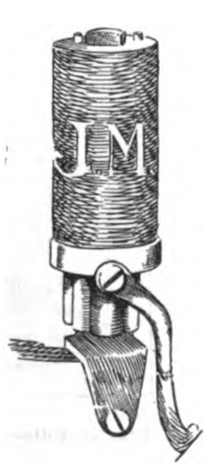
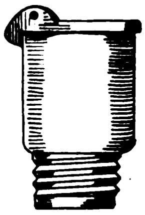
The Autofilter, marketed by the Bousman Manufacturing Company, 18 Plainfield avenue, Grand Rapids, Mich., is as the name implies, designed to separate water and foreign elements from the fuel and is incorporated between the supply tank and the carburetor. It presents interesting features in that the lower part of the device is provided with glass windows, making it a simple matter for the operator to note if the filter needs draining of sediment, etc. It is constructed of brass and the sight members are so secured that they are leak proof and protected from injury.


AUTOFILTER

The Ford J. M. Shock Absorbers are manufactured by the J. M. Shock Absorber Company, 210 South 17th street, Philadelphia, and are designed expressly for model T Ford automobiles. They comprise the same features of construction and material as the larger sizes. They are attached easily to the rear spring and the work does not require any change or the use of special tools. They not only serve as an auxiliary spring, making for easy riding qualities, but hold the rear wheels to the ground, insuring continuous traction. The absorbers are moderately priced and the company issues an interesting booklet which will be sent free.


J. M. FORD SHOCK ABSORBER


WAHLSTROM OIL CUP

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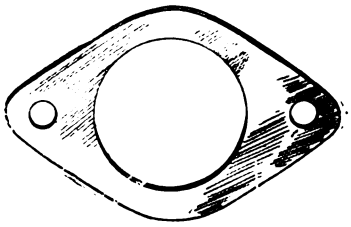
The Wahlstrom Oil Cup, manufactured by the Wahlstrom Tool Company, 346 Carroll street, Brooklyn, N. Y., is a dust proof oiling device which is fitted by means of a screw driver, the cup having a slot for this purpose. The cover is retained by a spring which may be lifted by the spout of the oil can when lubricant is being inserted. The oil aperture is straight, permitting of cleaning with a wire. The cup comes in sizes from .25-inch, 32 threads, to .5 inch, 24 threads.

The Wilmington Gasket is the product of the Wilmington Fibre Specialty Company, Wilmington, Del., which concern specializes in hard vulcanized fibre in different forms. Although the gaskets are constructed of fibre, the material is flexible, making it an easy matter to utilize them on poor fitting joints. They are designed especially for parts subject to considerable heat and are made to meet individual requirements.


WILMINGTON GASKET

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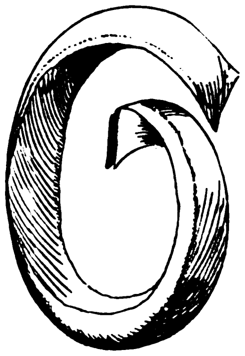
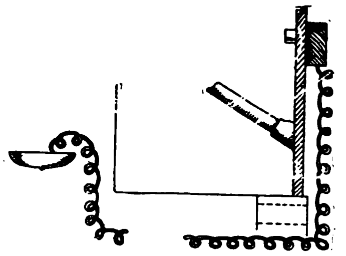
Security Reliners are manufactured by the Security Reliner Company, Inc., Montgomery, N. Y., and as the name implies are designed for insertion in the shoe to strengthen tires which have become worn and are subject to a blow-out. The reliners are constructed of high grade material and of such thickness that ordinary punctures are prevented. They come neatly rolled, are inexpensive and may be easily fitted into place.


SECURITY RELINER

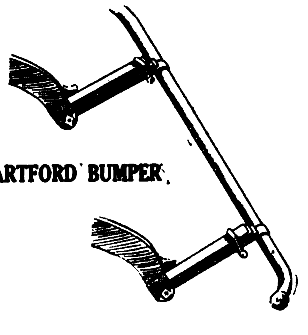
The International Thief Alarm is being marketed by the International Automobile

Thief Alarm Manufacturing Company, 151 West Sixth street, St. Paul, Minn., and presents interesting features in that a concealed gong of liberal size is sounded by electricity if the car is started. The device comprises in addition to the alarm, a Yale lock and a switch, the former being actuated by a key. On leaving the car the switch is locked, cutting out the current from either the magneto or battery. If an attempt is made to start the motor with the switch locked the current is diverted to the gong, which continues to ring until the switch is unlocked with the key. The working parts being concealed, there is nothing to indicate that the machine has an alarm. The equipment is complete and is accompanied by full instructions.


INTERNATIONAL THIEF ALARM

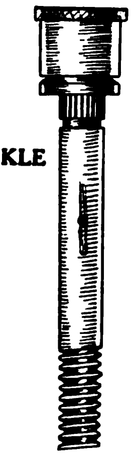
* * *

The Hartford Bumper is a recent product of the Hartford Suspension Company, Jersey City, N. J., and one of its qualities is its simplicity, both in construction and attachment. It is of the friction spring design and comprises in addition to the conventional bumper bar, two friction spring arms, two spring mounting saddle sockets, two clips or U bolts, two clip yokes and four clip nuts. Each spring arm has four leaves, which distribute the shock of collision, and not only prevent the colliding object from coming in contact with the car, but absorb the greater part of the impact, thereby saving the machine from undesirable stresses. One of the qualities of the Hartford device is that it may be attached easily by anyone, being clamped to the top of the side members of the frame, requiring but a monkey wrench to fit. It is made in four models, large, medium, small and special. The last named is designed for model T Ford cars. The maker lays great emphasis upon the fact that the construction is such that it cannot rattle.

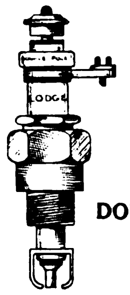

HARTFORD BUMPER.

* * *

Spring and Shackle Bolts are subject to considerable wear and when not lubricated properly require replacement. The Electric Welding Products Company, Cleveland, O., is manufacturing spring and shackle bolts of high grade open hearth steel, machined, case hardened and ground to size. The bolt is provided with a grease cup with screws over the top of the bolt bed and when rotated forces lubricant through the bolt into a groove. The cap is prevented from loosening by a spring in the bolt head which engages with recesses inside the cap each quarter turn. These spring and shackle bolts are manufactured in any diameter or length to meet the requirements of the purchaser and can be utilized on cars not equipped with lubricating devices.

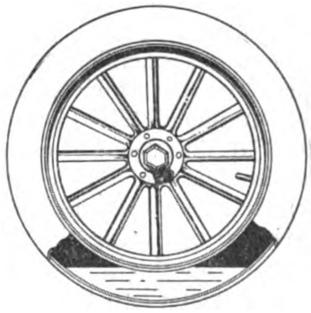

COMBINED SPRING AND SHACKLE BOLT

Lodge Double-Pole Spark Plugs permit of dual sparks in the combustion chamber of the explosive type of motors and without altering the ignition system, thereby increasing the efficiency of the power plant. The plug is so constructed electrically that two simultaneous flames are produced by the high-tension circuit, the installation being made easily. This is made possible by two secondary connections or terminals on the plug, to which the wires from coil or magneto are secured. The plug is constructed of high grade material and the Kimball Manufacturing Company, Motor Mart, Park Square, Boston, is agent.


LODGE DOUBLE-POLE PLUG

* * *

Sealo, manufactured by the Sealo Tire Company, 1409 Michigan avenue, Chicago, is a fluid which is injected into the inner tube through the valve stem and the maker claims that it will instantly and automatically seal punctures without loss of normal pressure. It is stated that the fluid preserves the rubber, does not cause sticking of the inner tube to the shoe, will not freeze or evaporate, and is not injurious to the paint or varnish. It is introduced by a special injection gun which is loaned by the maker.


SEALO

Recent Patents of Interest

Craig Tire Cooling Device.

Friction creates heat and to prevent the pneumatic tire from becoming overheated, Andrew B. Craig, Tarkio, Mo., has invented and patented a cooling device. The wheel is provided with a circumferential cooling tube of less diameter than the shoe and located within the latter, having ends spaced from each other. A short tube is connected with one end of the cooling tube and extends through the rim, communicating with the outside air. A pump actuated by an electric motor is located on the wheel, and is connected by tubing to the other end of the cooling tube. Cool, fresh air is thus circulated through the cooling member.

Haas Gasoline Strainer.

Cyrus A. Haas, St. Louis, Mo., has been granted a patent for a gasoline strainer which differs radically from the usual filter in that it is a tubular casing, internally threaded at one end and having a polygonal shaped plug with a reduced exteriorly screw threaded portion. A head is provided at the opposite end of the casing and means fitted for the attachment of the fuel line. The strainer is a sack of wire gauze, having an open contracted end and being secured within the bore of the plug, it being intended to prevent the release of foreign particles within the sack. The latter is fluted longitudinally and is expanded throughout its entire length beyond the contracted portion to the rounded end of same, and is adapted for movable contact with the inner periphery of the casing, an arrangement claimed by the inventor to permit of the insertion of the sack as well as turning of same.

Zwolinski Automobile Lock.

The large number of thefts of automobiles has been responsible for many locking devices to prevent operation of the car by others than those intended. Thaddeus Zwolinski, San Francisco, Cal., has been granted a patent for an automobile lock which is designed to secure the gear shifting lever in a neutral position and thereby prevent operating the machine under its own power. The device comprises a supporting bar which is secured to the frame of the chassis and has a suitable opening into which the lever is placed when in the neutral position. The supporting member has a U shaped hasp, having one leg hinged to the end of the bar and a locking mechanism carried by the other extremity. When not in service the locking member may be swung back out of the way.

Newbold Battery Terminal.

Roger M. Newbold, Chicago, assignor to the Adams & Westlake Company of that city, has been granted a patent for a storage battery terminal. It comprises flattened posts having apertures in one of their faces, these being in the form of a channel extending through the post face, and threaded studs set through each post and passing through and beyond the aperture thereof. A pair of line terminals is provided, each with an eye for engaging one of the studs, this having a flat face for bearing against the post, while the other terminal has lateral lugs for entering the post channel and nuts engaging the studs.

Green Tire Casing.

Walter R. Green, Chicago, has been granted a patent for a protective casing for pneumatic tires. It comprises a sheet metal member conforming to the shape of the shoe and means for embracing or fitting the same. The device is made in sections, two of which overlap the air valve stem and the parts are hinged. A plurality of apertured segments are provided and so shaped as to fit into the outer tire casing. The casings are secured by a nut locking arrangement and provision is made for adjustment.

Marston Signalling Device.

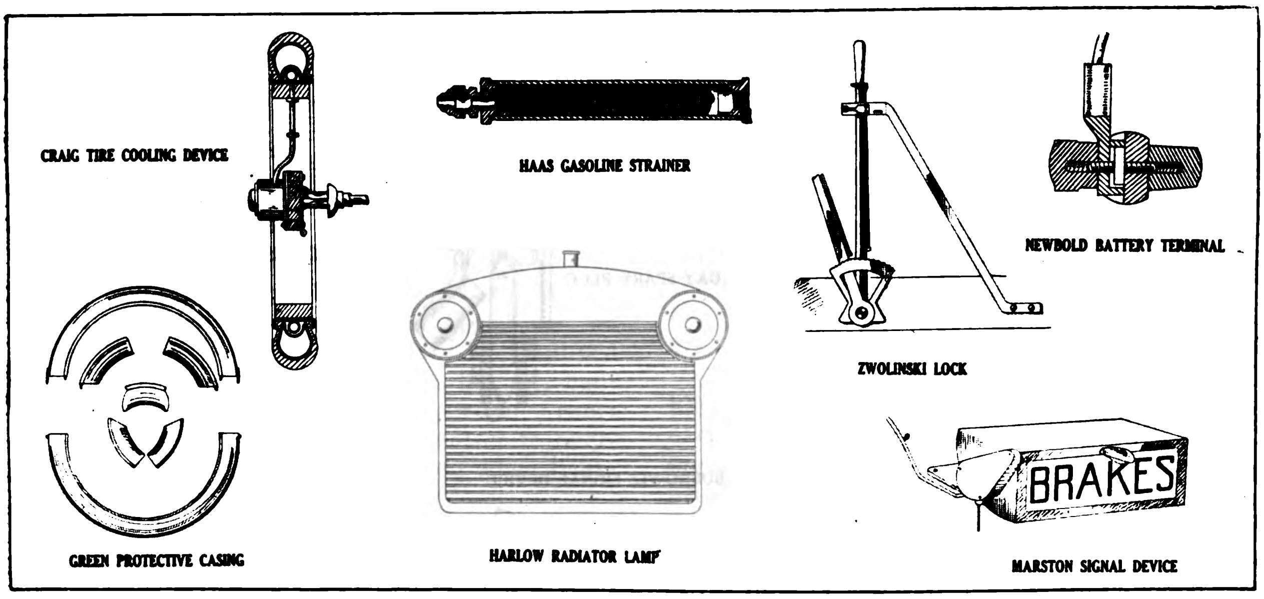
Among the inventions designed to prevent rear end collisions by notifying an approaching vehicle is the Marston signalling device, patented by Charles F. Marston, Great Neck, N. Y. It is mounted at the rear of the machine and is so arranged that when the brakes are applied for stopping the word "brakes" is shown upon a casing member. Within the latter is a journalled shaft with one end extending exteriorly and having a toothed wheel which is free to rotate. A drum turns on the casing and has an integral toothed wheel in mesh with the gear upon the shaft. The signal is mounted in the casing and is adapted to be swung by the shaft member. A flexible connection is made between the drum and the brake mechanism and operated as above described. A spiral spring is employed for returning the signal to normal position when the brakes are released. Means are provided for illumination at night by an electric lamp.

Harlow Radiator Lamp.

Don W. Harlow, Cleveland, O., has been granted a patent for a radiator lamp, the feature of which is its location in the radiator. Two are mounted in this manner and the cooler is specially constructed for the design. The lamp casing is rigidly mounted and contains the usual reflector and bulb retaining mechanism, but the glass front of the light is flush with the casing. Means are provided for adjusting the lamp.

Clark Spring Protector.

A patent for a spring protector and shock absorber has been granted Robert P. and William H. Clark, Fresno, Cal. A rigid bar is fitted and secured to the usual spring member by clips at the centre and the shape of the bar is such that a space is provided at its ends. To the latter are pivotally connected links having rollers which bear and move on the upper face of the spring when the latter is depressed. The bar device is also equipped with elastic bumpers to check the downward movement of the spring. It is claimed that the roller controls the movement of the spring in such manner that violent shocks are eliminated.



Some Recent Patents Applicable to the Motor Car, Including Protective Tire Casing, Rear Signalling Device, Fuel Filter, Radiator Lamp, Lock and Battery Terminal.

Lloyd-Horry Muffler.

A muffler for internal combustion engines that presents novel features, inasmuch as one of its walls is flexible, has been patented by Alfred Lloyd-Horry, assignor of one-half to Horace Otto Little, San Francisco, Cal. It comprises a chamber having a wall of flexible material which is clamped along its edge portions, and having its body portion free to move under varying pressures within the chamber. The usual inlet and outlet openings are provided, the outlet pipe extending into the chamber and being provided with a number of perforations. The expanding chamber is enclosed in a casing.

Burrowes Horn Device.

Edward T. Burrowes, Portland, Me., has patented an attachment for the bulb type of signal horn which is designed to prevent operation of the member when the machine is left unattended in the street or garage. A valve is incorporated between the bulb and horn, in proximity to the former, and means are incorporated for locking the valve. The latter is locked by moving the bulb into a stated position, the mechanism including a co-operating lug notch and also a spring for retaining the lug in engagement with the notch. The spring is so arranged and located between a part of the valve and wall of the casing that a constant air passage is provided. The valve structure is provided with a large opening when service of the signal is desired, and a smaller discharge aperture for egress of the air when the device is locked.

Stuller Motor Starter.

A self-starting device for internal combustion motors and utilizing compressed air, has been patented by William L. Stuller, Detroit, assignor of one-fourth to George W. Soules, one-sixth to Edward C. Campau, one-sixth to Thomas R. Bell and one-sixth to William H. Soules of the same city. The periphery of the flywheel of the explosive motor is provided with gear teeth which mesh with a pinion on the driving shaft of the starting device which is an air motor, being operated by a tank of compressed air. The pinion is attached to the shaft which moves it into or out of engagement with the flywheel as desired. The piston of the air motor actuates the pinion and the energy is controlled by a manually operated valve and means are incorporated for returning the piston to normal position.

Day Protected Spark Plug.

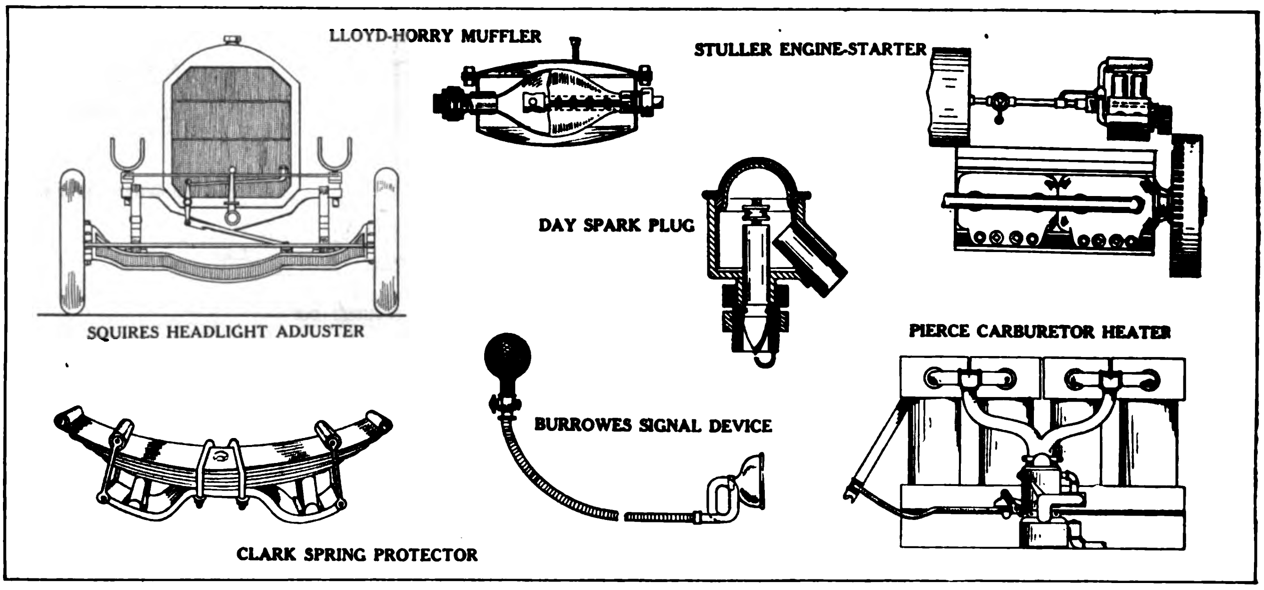
George F. Day, Winthrop, Mass., has been granted a patent for a protected spark plug, the plug proper being similar in construction to the ordinary members, but is equipped with a protective cover or hood. Instead of utilizing the usual packing nut a circular housing is screwed into the shell and the former serves for a dome like cover or cap. The cable is led through an opening in the side of the circular housing and the aperture being inclined, prevents the entrance of water or foreign elements.

Pierce Carburetor Heater.

A novel method of heating the carburetor is noted in the patent granted Burt Neulon-Pierce, Indianapolis, Ind. The heat of the exhaust of the motor is utilized, it being taken from the exhaust pipe and led through a valve and tube to the vaporizer. A valve is incorporated in the connection at the exhaust member and is operated simultaneously with the throttle of the carburetor, its object being to increase the amount of heat in proportion to the fuel utilized.

Squires Headlight Device.

Among the more recent devices for controlling the direction of the headlights in proportion to the movement of the front wheels, is the invention of Pembroke N. Squires, Canon City, Col., to whom letters patent have been granted. The lamps are pivotally mounted and connected by a rod which is actuated by another rod secured to a pivotally mounted arm on the front cross member of the frame. Mounted on the axle is an arm secured at its middle, and attached to this member is an operating rod secured to the steering mechanism. Another rod connects the axle lever with that on the frame.



Some of the More Recent Inventions Applicable to the Motor Car, Including a Muffler with Flexible Wall, Self-Starter Operated by Compressed Air, Novel Shock Absorber, Locking Device for Horn, Etc.

OTHER PATENTS GONE TO ISSUE.

Tire Mail, Joseph B. Duhring, Chestnut Hill, Penn. A tire mail comprising crossed strands of chain links, the links of one strand inclosing a single loop in the adjacent link of said strand and the superimposed link of a crossing strand.

Oil Can, Ralph A. Wakefield, Sacramento, Cal. The can is similar to those of conventional construction, but carries a spring actuated pin projecting from the bottom to the top of snout. By compressing the bottom of the oiler the pin is forced away from snout opening, allowing the lubricant to flow. Normally the spring retains the head member upon its seat, closing the aperture.

Ignition System, Edwin S. Lincoln, Brookline, Mass. An ignition system comprising a generator, an induction coil, a circuit breaker having normally contacting separable contacts, and an electro-magnet for separating said contacts, a non-interruptible circuit connecting the generator with the coil through the magnet, and an interruptible circuit including said separable contacts and connected across the terminals of said coil.

Sanding Device for Cars, George F. A. McDougall, Dorchester, Mass., assignor of one-third to Christos John Scoulikas, Boston. The mudguards are utilized to carry the sand which is released by a lever member through a multiplicity of spouts, spraying the sand in front of the traction wheels. The lever is mounted convenient to the operator of the automobile.

Fastening Device for Tires, William Robert Morrison, Chicago. A tire fastening device embracing in combination with the felloe and rim an expansible and a contractible clamping ring between the wheel rim and the expansible clamping ring on each side of said wheel rim. The rings act mutually to draw a tire about the wheel, and an angled guard ring secured on each side partly covers the rings and co-operates in retaining the guard rings, which are anti-skidding members.

Valve Spring Compressor, Axel Peterson, New York City. The device is a valve spring lifter comprising a beam having a laterally projected fork at one end to engage the valve spring, while the other extremity has a pivoted rod and a lever. Moving the lever contracts and retains the valve spring as well as locks the tool.

Rubber Tire Protector, Joseph A. Utter, Crawfordsville, Ind., assignor of one-half to John F. Utter, San Francisco, Cal. It comprises an annular, trough shaped tire protector having interengaging notches in its opposite edges adjacent its ends, the bases of the notches being located in the median line of the protector.

Inner Tube Guard, Siegfried Goodman, Bayonne, N. J. It comprises a casing of strips of textile fabric cut diagonally to the weaves thereof and having V shaped incisions formed at both edges. The latter are brought together by strap devices arranged in pairs.

Automobile Buffer, Allan L. McGregor, Chicago. An automobile bumper device having a buffer bar, clamps for securing to side bars and slidably mounted cushioning springs on arms.

Exhaust Silencer, Franz Emil Wolf, Nowawes, near Potsdam, Germany. A muffler having a plurality of plates fastened together in space relation and so arranged that the noise of the exhaust is throttled.

Puncture Proof Inner Casing, Thomas F. Shiels and Willis Ray Bolter, Lowell, Mich. An inner casing for pneumatic tires comprising a puncture proof fabric formed of an outer layer of canvas, layers of woven cane and other layers of fabric and rubber, the members being vulcanized together. A ring device is utilized for securing the casing.

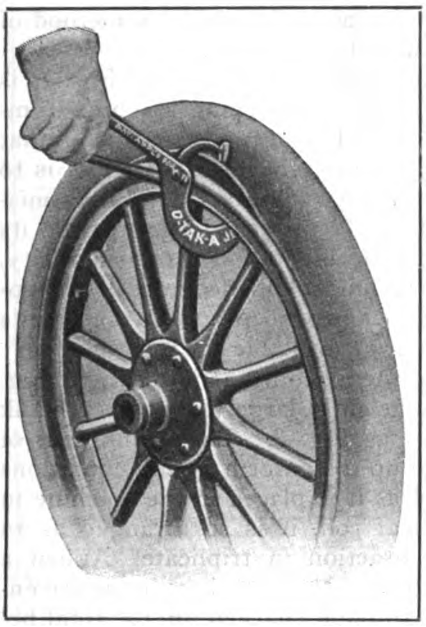
Wrench, Charles A. Bancroft, Norfolk, Va. A wrench having a nut engaging device mounted in the body portion, a pawl pivotally mounted and means for engaging rotating member operated in either direction.

Nut Lock, Charles Thomas Hunt, Los Angeles, Cal. A nut lock comprising a thin annular washer, with a narrow slot therein, and a tooth at each end of the slot projecting inwardly and adapted to engage the bolt.

Carburetor Temperature Regulator, Davis Barnard, Los Angeles, Cal. A thermostatic air regulator, a casing, means to conduct cold or hot air to casing, one inlet being regulated by a manually operated shutter while the other side is actuated by a thermostatically operative damper, and a thermostat to operate said damper.

O-TAK-A TIRE REMOVERS.

Regular Tool Is Supplemented by a Junior Adapted for Cars with Clincher Tires.



Showing the Application of O-Tak-A Junior to a Clincher Tire.

Announcement is made by J. W. Grumiaux, sales agent, Le Roy, N. Y., of the O-Tak-A Junior, a special tool for removing clincher shoes, designed and specially adapted for Ford, Metz and Brush cars. It is suited for all clincher shoes and the principle is identical to that employed on the O-Tak-A tire tool. It will loosen a clincher shoe from the rim and push it back far enough so that the bead may be pried out easily. As will be noted by an accompanying illustration the tool is equipped with two tong like extremities having handles which when brought together exert such pressure that it is a simple matter to overcome the resistance of the shoe even when badly rusted to the rim.

A feature of the design is that one tong fits the inside rim while the other has a projection so designed that when pressure is applied the bead is forced slightly downward and back. This prevents the tool slipping and at the same time energy is applied to the bead and not the walls of the casing. After the contact between the bead and rim is broken a further movement of the tool carries the shoe up and away from the rim, making it an easy matter to remove it. The O-Tak-A Junior is not only inexpensive, but it will not injure the paint, and being compact may be easily stored in the tool box. The method of applying the device is shown in an accompanying illustration.

The O-Tak-A differs from the Junior in that it is adapted to quick detachable and demountable rims. It may also be employed for large clincher tires, a small attachment being slipped over the nose of the plunger converting the tool into one suitable for this work. The large design is made in two sizes, the No. 1 fitting tires up to and including four inches and the No. 2 four inches and over.

The tool in service is shown in an accompanying illustration and it will be seen that the nose of the plunger passes over the locking ring of the tire and acts at right angles to the plane of the wheel. The tool locks at its extreme inthrow, being set so as to hold the inner ring just back of the flange of the locking ring, permitting easy removal of the latter and the tire. As it locks automatically the operator has both hands free to handle the shoe and locking ring. The yoke carries an extension which comes in contact with the under side of the rim extending beyond the felloe. This acts as a shoulder and prevents the tool from slipping.

A quality of the device is that tires may be removed from demountable rims easily and quickly either on the car or in the garage, a task usually involving considerable labor, especially some types of rims that require considerable pressure. The O-Tak-A, either large or small, is constructed of high grade material and is guaranteed to perform the work claimed of it. It is finished in aluminum or nickel.

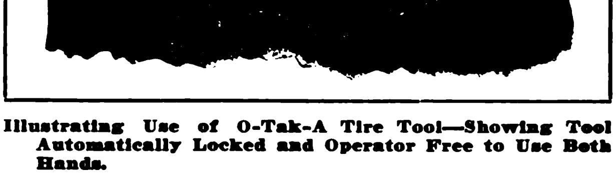
SECURES MANUFACTURING PLANT.

New Detroit Concern to Produce Automobile Fenders and Stamped Steel Goods.

John W. Murray, formerly connected with the Michigan Steel Stamping Company, Detroit, has purchased the buildings and site at Clay and Michigan Central streets, formerly occupied by the Old Crown White Lead Company, and will begin the manufacture there of automobile fenders and other articles in stamped steel.

Machinery has been installed and operations have been begun. There are two brick buildings, each two stories high, and a frame structure, giving a total floor space of 22,000 square feet. The property, which was formerly owned by the Acme White Lead Works, is valued at $50,000.

Bringing to a fitting close a day at the factory, the Ford Motor Company, Detroit, maker of Ford cars, recently entertained more than 500 branch managers, dealers, bankers and others from Indianapolis, Ind., Columbus, O., and Pittsburg, Penn., at the Hotel Tuller, Detroit. Norval A. Hawkins, sales manager of the company, was toastmaster.



Illustrating Use of O-Tak-A Tire Tool—Showing Tool Automatically Locked and Operator Free to Use Both Hands.

AUTOMATIC GARAGE ACCOUNTING SYSTEM.

New Bookkeeping Machine Is Ingenious Monitor of Owner's Business—Prevents Irregularities, Compels Honesty, Eliminates Lost Charges Through Carelessness.

WHEN a garage proprietor arrives at the conclusion that he is not securing the profits to which he believes his investment entitles him he immediately institutes an inquiry into his business in an effort to locate the difficulty. Possibly he may discover it, but unless he has been keeping close account of the activities of the various departments he will be confronted with a difficult task. He may conclude that locating the leak is impossible, but he is not pleased with the idea of again facing the deficit he has just encountered. Logically, he begins another and different kind of search, that of securing a corrective.

He realizes that his only certain remedy for leaks, which cause a severe drain upon his resources, if not an actual deficit, is the inauguration of a system of account keeping, which he may have neglected principally because he was too busy to consider the matter and because his business was in a flourishing condition. It is only when he is confronted by a big leak that he appreciates the need of system, but his most serious concern is then found to lie in its selection.

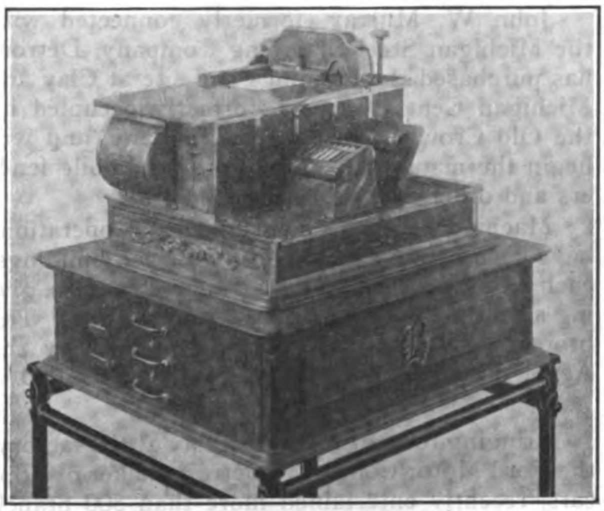


Fig. 1—The Hainer Bookkeeping Machine, with Index Drawers Forming Base.

There are many systems. Some of them are efficient. Others are unwieldy and cumbersome, and the garage man's concern is in adopting one that is simple and at the same time amply efficient. Numerous good systems, suitable for large and small garages alike, have been presented in these columns. All of these methods of account keeping have been simple and easy to understand, and their efficiency has been demonstrated by usage in prosperous garages.

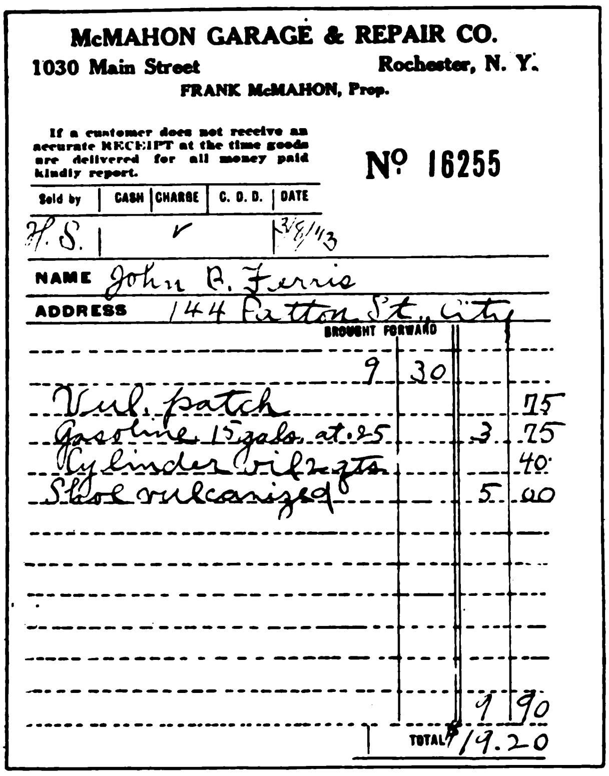
The system here introduced is in all essentials extremely simple and is applicable to the largest as well as to the smallest garage in existence. It consists of a bookkeeping machine that eliminates the necessity of maintaining a set of books, such as ledger, day book, cash book and the numerous other books incidental to the ordinary method of tabulating business transactions.

This machine, which is shown at Fig. 1, is made by the Hainer Bookkeeping Machine Company, Providence, R. I., and is so constructed that it may be applied to any business. Its aim is to provide against the possibility of leaks or mistakes in accounts. Its principal features are its compactness, practicability and utter simplicity, and it needs no technical knowledge of bookkeeping to operate so as to keep accurate accounts that instantly can be available for reference.

In the top of the machine, as is shown at Fig. 1, is a space sufficiently large to expose a blank form, illustrated as Fig. 2. This blank can, of course, be made up to conform to any conditions of business, and as it is placed in the machine in a large, loose leaf roll, it is so arranged as to record each transaction in triplicate. When a transaction is concluded the various items are entered upon this roll and charged up, the total being placed at the bottom of the sheet in the space provided. A lever at the left side of the machine is then turned and the apparatus automatically discharges two duplicate sheets into the hands of the operator, one of which is of white paper and the other pink. The triplicate yellow leaf is simultaneously deposited in a locked record chamber at the rear of the machine. The key to this locked compartment is usually kept by the proprietor of the garage, while the employee files the pink sheet in any place which may be so designated, giving the white sheet to the customer to serve in the nature of a receipt or as a bill for the transaction.

Thus it will be seen that the proprietor of the establishment can utilize the yellow sheets taken from the locked chamber to check against the pink slips placed on file by the employee or employees. There is also the record given to the customer, who may or may not keep this for his own use to check against his bill when it is submitted to him. If he does not retain it, it is obvious that he can have no legitimate complaint against a bill, inasmuch as he possessed a record of the transaction at one time expressly for such a contingency.

The Hainer bookkeeping machines can be purchased, at the option of the buyer, with a base composed of three or more drawers, the number of the latter depending upon the amount of business which is to be intrusted to them. In them an account file is arranged. In the view at Fig. 1 three drawers are shown. The cash drawer forms the base of the machine itself, at the top of the stand containing the three drawers. If the business is of such magnitude that many hundreds of accounts are maintained, it is obvious that a greater number of drawers will be needed. At Fig. 3 is shown the interior arrangement of the drawers. In this specific instance 100 automatic accounts are shown.



McMAHON GARAGE & REPAIR CO.

1030 Main Street **Rochester, N. Y.**

FRANK McMAHON, Prop.

If a customer does not receive an accurate RECEIPT at the time goods are delivered for all money paid kindly report.

Nº 16255

Sold by	CASH	CHARGE	C. O. D.	DATE
H. S.		✓		3/8/13

NAME John B. Ferris

ADDRESS 144 Patton St., City

	BROUGHT FORWARD		
	9	30	
Vul. patch			.75
Gasoline 15 gals. at .25		3	.75
Cylinder oil 2 qts.			.40
Shoe vulcanized		5	.00
		9	90
		TOTAL $	19.20

Fig. 2—Complete Bill, Showing Amount Brought Forward, Itemized Account of New Transaction, the Total and Beneath It the Grand Total of Bill.

Each account occupies but a single line and it never needs any more space. With this arrangement, when an employee gives a record to a customer, the pink slip is inserted beneath the name in the file. For instance, in the case shown at Fig. 3, when John B. Ferris' account is totalled and the amount, $19.20, placed in the space at the bottom of the blank, the name plate is raised, the blank is slipped beneath it and the plate is restored to its former position, leaving only the total amount visible. Under the slip just inserted are the items of the preceding slips. When looking at the index the employee also is looking at the account without having to search it out afterwards. Space is conserved by each account underlapping the one just above it.

It must be admitted that many garage owners do not care to have their accounts available for employees to inspect, thus enabling them to determine exactly the status of the business as well as can the proprietor himself. In this event the lower portion of the machine can be placed in the office, the machine itself being left where the employees may operate it. The blanks are then deposited in a box or other suitable receptacle, from which they may be taken by the proprietor once or twice daily and filed in the cabinet in the office. He thus is able to preserve his accounts up to the minute and upon inquiry can inform a customer the status of his bill without delay. He has no books to maintain and needs none, all transactions being recorded in the machine.

At the right of the blank form in the top of the machine is a cash tally roll. After an entry is made a plunger, which may be seen in the right of the machine at Fig. 1, is pressed down, and the cash drawer immediately opens. Cash transactions are registered on the blanks similar to charge or C. O. D. accounts and record of these is also made in triplicate, a yellow sheet being deposited in the locked chamber. Thus an accurate record can be kept of cash receipts and it is impossible for an unscrupulous employee to alter an account without detection. Should he do so it would be discovered when checking up the slips filed in the index with those deposited in the locked compartment. It is obviously impossible for an employee to accept payment of an account and place it in his pocket without registering upon the machine, for no customer will pay a bill without receiving a receipt. In order to secure this the machine must be operated, thus disclosing the transaction. Furthermore, the garage management makes it plain to patrons that they must take a receipt for all items as a safeguard against possible errors.

Whether it be a cash or charge account, each blank is made out in detail and the proper charge recorded against each item. Thus, these itemized bills can be used to check against the various other departments, such as stock and supplies, etc. Most large garages maintain a system of stock requisition and receipt, in order that it may be known when and for what the stock is used. The stock clerk gives a receipt to the mechanic in return for the stock requisition sheet presented by the latter. These are checked against each other in order to keep track of supplies used. Since stock is usually required for certain jobs, it is charged up on the bill which passes through

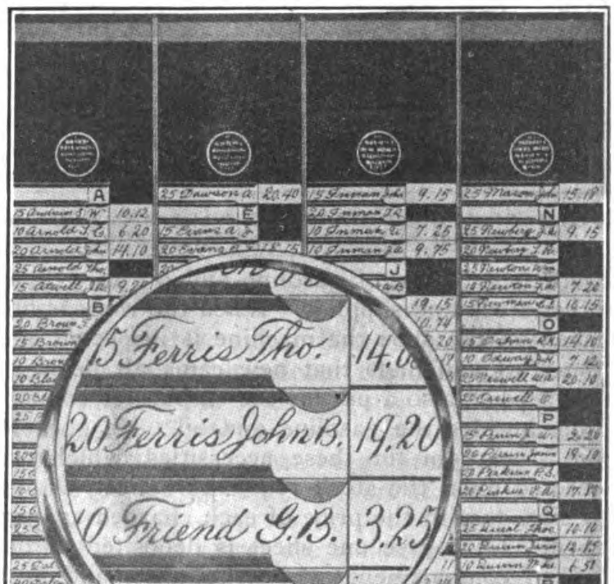
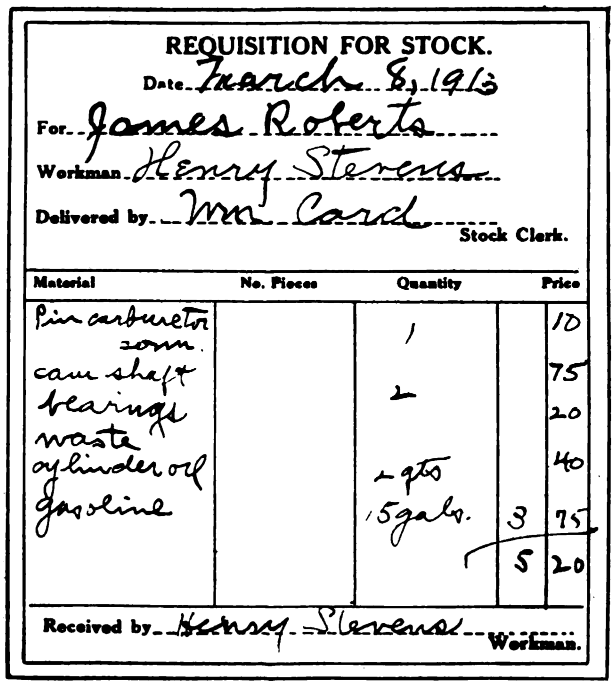


Fig. 3—Interior Arrangement of Index Drawer, Showing Appearance of Account at Fig. 2 After Filing.

the bookkeeping machine. These bills can be checked against the stock sheets to determine the correctness of the stock tally.

In one large garage a second machine is also used in the stock department, in addition to the one used for cash and charge accounts. This machine is fitted with a blank arranged as a stock requisition sheet, which is filled out by the stock clerk, who also affixes the price of each article opposite. As the blank is made in triplicate the workman and clerk each retain one to prove that the material was delivered and received.

To show the process of a job, James Roberts drives his machine into the garage and requests that a shoe be vulcanized, his carburetor readjusted and the machine generally inspected. He also wants 15 gallons of gasoline and two quarts of cylinder oil. These items are placed upon a repair tag which is attached to the car. To facilitate business, it is assumed that the stock clerk has charge of gasoline and oil as well as other stock and supplies. When the work is finished on the shoe the machine is inspected and the workman finds that new camshaft bearings are needed, also a pin for the carburetor connection, besides the gasoline and oil. He goes to the stockroom for these necessities, which are entered upon the stock requisition sheet, shown at Fig. 4, with the price of each charged against them. Of course one sheet is deposited in the locked compartment, while the white and pink sheets are received by the clerk. The latter retains one and gives the other to the workman as a receipt. It will be seen that three records are kept of each transaction for comparison, the clerk's, the workman's and the proprietor's.



REQUISITION FOR STOCK.

Date March 8, 1913

For James Roberts

Workman Henry Stevens

Delivered by Wm Card Stock Clerk.

Material	No. Pieces	Quantity	Price	
Pin carburetor conn.		1		10
cam shaft bearings		2		75
waste				20
cylinder oil		2 qts		40
gasoline		15 gals.	3	75
			5	20

Received by Henry Stevens Workman.

Fig. 4—Stock Requisition Blank, Which Also Serves as Receipt to Workman and Stock Clerk.

When a job is completed the workman enters the various items upon the customer's bill in the bookkeeping machine, utilizing the stockroom prices as put upon his receipt by the stock clerk. The latter has an index file in his machine also and each slip is placed where it can be immediately available for comparison with the accounts maintained in the office machine. Charges for storage, washing, polishing, etc., are familiar to the workmen, information of doubtful charges for special repairs being secured from the foreman.

In the event of a record being lost, there is no possibility of a lost charge as is the case with many systems of bookkeeping. If all were lost there is still the record in the locked chamber to reveal the transaction, while at the same time it prevents collusion between dishonest employees. Happily, these are infrequently encountered, but the human equation is a possibility that a business man cannot afford to overlook.

In a small garage such an elaborate system is not necessary, for the proprietor is usually at hand to attend to the business himself, and the machine adequately and effectively cares for all accounts with a minimum of labor and with no necessity of keeping books. Once installed it is easy to manipulate. There is no complicated machinery to keep in order and when one roll of paper is exhausted another may be inserted by merely lifting the top of the machine, which swings upward on a hinge, thus exposing the interior. When the roll has been inserted in position the yellow sheet is drawn over the writing base at the top, a piece of carbon paper being placed above it. The same process is repeated with the pink sheet and the white sheet is placed over last, as this sheet receives the first pencil impression. At the side of the writing base is a sort of clamp, which fits closely over the edge. The carbon paper is folded under and around the edge of the base and the clamps at the sides securely fasten it. As the paper roll is of less width than the base, it escapes the clamp and with each turn of the machine it slides along easily, while the carbon paper is held in position for use on the next sheet.

This is considered the best method of taking the triplicate, although if a purchaser desires, carbonized paper can be furnished. This is a matter of individual taste and the results obtainable are the same. Each roll contains 15,000 sales slips and orders for these can be placed according to the volume of business done. The machines can be adapted to any condition of business and are furnished according to the desires of the customer. The machine itself is separated from the base if desired, in order that the index file may be maintained apart from prying eyes. In short, the advantages of the system may be summed up as follows: There are no books requiring after work on accounts, which are always up to the minute; a lost slip does not endanger an account; protection against the failure to make a record and against errors in accounting and swiftness in recording an account. The machines can be purchased upon favorable terms and in any style desired, the price for a complete equipment being exceptionally reasonable.

MAXWELL ABSORBS FLANDERS.

Formal Announcement Indicates That Previous Information Was Somewhat Premature.

Announcement is made by the Maxwell Motor Company, Inc., that arrangements have been completed for the acquisition by it of the property and business of the Flanders Motor Company, subject to the necessary corporate action on the part of the two companies, which it is expected will be obtained shortly. Pending the transfer to the Maxwell company of the property of the Flanders company, the latter will be operated as a branch of the Maxwell Motor Company.

Commenting upon the formal announcement, a prominent officer of the Maxwell company stated that while it was generally understood in the trade that the Flanders company was already a part of the Maxwell concern, this was not so, action being delayed until inventories were taken, audits made and other matters straightened out. Simultaneous with the absorption of the Flanders Motor Company, the financial and accounting officers of the Maxwell company were removed to Detroit. That city now becomes the centre of operations for the new concern.

PURCHASES DETROIT FACTORY.

Peninsular Lead Works Plant Acquired by Syndicate Interested in Automobile Parts.

K. S. Morgan, representing a syndicate which will manufacture automobile parts, has purchased the three-story solid brick factory at Lieb and Guoin streets, Detroit, of Edward J. Schmidt, who made the sale as president of Traugott Schmidt & Sons. The consideration is said to have been $40,000 cash.

The plant, which has a frontage of 250 feet and a depth of 125 feet, was erected by the Peninsular White Lead Works, and has been successively occupied by the Schmidt company and Keen & Co., maker of automobile parts. Improvements to the property are being made with a view to beginning immediate operations.

BRANCH FACTORY IN TOLEDO.

Perfection Spring Company to Erect Plant Near Willys-Overland Property.

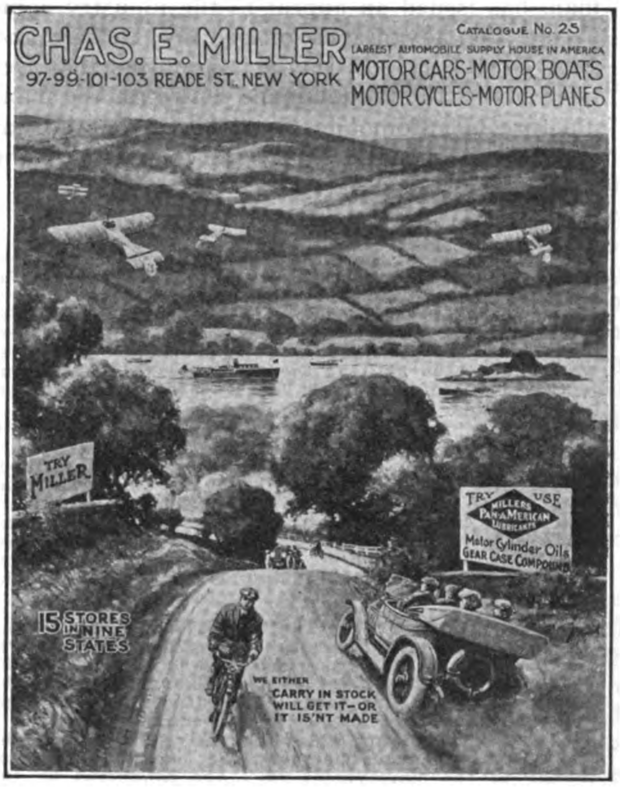
It is announced that the Perfection Spring Company of Cleveland, O., is to build an automobile spring plant at Toledo, O., and construction work will begin in a few weeks. The Perfection company recently purchased six acres of land, situated between the Willys-Overland company and the boulevard, with railroad frontage.

According to Christian Girl, president of the company, the capacity of the plant when finished will be 9000 tons a year. A large portion will be run exclusively for the Willys-Overland company, with which the spring concern has long time contracts. About 100 men will be employed at the start, but later it is expected that fully 800 men will be engaged.

MILLER'S ANNUAL CATALOGUE.

Attractive Cover Design Adequately Forecasts Nature of Its Contents.

The 25th annual catalogue issued by Chas. E. Miller, 97-103 Reade street, New York City, still further accentuates the pioneer position occupied by this house in the automobile accessory field. This edition was ready for distribution about April 10. A reproduction of the front cover is presented herewith, and it will be conceded that it is one of the most artistic yet developed by that concern. The appearance thereon of the automobile, motorcycle, motor boat and aeroplane, indicates in a striking manner the nature of the accessories carried in stock.


CHAS. E. MILLER
97-99-101-103 READE ST. NEW YORK
CATALOGUE No. 25
LARGEST AUTOMOBILE SUPPLY HOUSE IN AMERICA
MOTOR CARS-MOTOR BOATS
MOTOR CYCLES-MOTOR PLANES
TRY MILLER
TRY USE MILLERS PAN-AMERICAN LUBRICANTS
Motor Cylinder Oils
GEAR CASE COMPOUND
15 STORES IN NINE STATES
WE EITHER CARRY IN STOCK WILL GET IT—OR IT IS'NT MADE

Presenting the Cover Design on Chas. E. Miller's Annual Catalogue.

The year 1913 marks a new departure, in that the policy of the house has been extended to include delivery of goods to any part of the United States by freight, express or parcel post. Although 15 branch stores are maintained in New York City, Brooklyn, Buffalo and Albany, N. Y.; Boston and Springfield, Mass.; Hartford, Conn.: Detroit, Mich.; Cleveland, O.; Philadelphia, Penn.; Atlanta, Ga.; New Orleans, La., and Newark, N. J., in addition to the main headquarters, this plan virtually places the immense Miller service in direct reach of all. The catalogue is complete in every respect, Miller's position as manufacturer, jobber, importer and exporter, being somewhat novel in the industry.

NEW YORK SEEKS DETROIT'S PLACE.

SEVERAL cities throughout the country have envied the position held by Detroit in the automobile industry, and during the past year or more chambers of commerce and merchants' associations have been exceedingly busy in an attempt to secure additional motor car factories. Early in the month the industrial bureau of the merchants' association in New York City held an informal dinner at the Hotel Brevoort, at which a number of automobile manufacturers and dealers were present by invitation. The object of the meeting was to discuss fully the possibilities for encouraging the motor car industry to locate in that city.

As a result of this conference, the industrial bureau, of which Henry Morganthau is chairman, has issued an appeal to the industry comparing the advantages offered by Detroit and New York City. In this it is admitted that Detroit now is the predominant centre for the manufacture of automobiles, but the reasons do not appear to be exactly clear to the committee. The statement reads in part as follows:

Advantages Offered by Detroit.

Two or three of the large manufacturers began operations in Detroit, but there seems to have been no special advantages over other cities in the Middle West. Having acquired an early lead in the industry, Detroit became more and more advantageous to the manufacturer on account of the many lines of subsidiary industries which have been built up there, inasmuch as the manufacturing of automobiles is largely becoming a process of assembling.

The labor market in Detroit is said to be excellent, because the mechanics there are largely specialized. During the last two or three years the trend of the automobile market has been westward and now the great consumption of pleasure cars is in the Middle West; hence Detroit is conveniently situated as regards the large market for pleasure cars. Detroit is also near the raw materials. In addition to these many advantages, Detroit offers the automobile manufacturer a liberal banking policy.

Some Disadvantages.

While these advantages are in the main true of Detroit, many of them are passing away because of the very concentration of the single industry there and the points mentioned are becoming positive disadvantages. These disadvantages may be briefly enumerated:

1—The demand for labor is greatly in excess of the supply. A statement has just come, backed by the authority of the employment exchange conducted by the State of Michigan, that the price on common labor will reach 30 cents an hour in Detroit before the end of this year. The demand for every kind of skilled labor, which is so large in the automobile industry, is becoming acute in Detroit.

2—The housing facilities of Detroit are absolutely inadequate to meet the demand and the building operations of the city are not being carried on with sufficient rapidity to offset the increase in population.

3—Detroit has grown so rapidly that it is quite unprepared to cope with its new responsibility. The street car lines, for example, are inadequate and many of the workers in the factories at some distance from the residential section of the city are held up for long periods in the evenings before they are able to get cars.

4—Shortages of freight cars in Detroit which have been in evidence during the past year and up to the present, have proved a great handicap to the automobile manufacturer.

5—While it is true that the banking institutions in Detroit have been on the whole favorable to the automobile industry, the soundness of the financial condition there is questioned by some. The resources of the banks are perhaps too intimately bound up with the automobile industry. Liberal loans to comparatively insecure automobile manufacturers are said to be uncomfortably common, and one or two failures among either the manufacturers or the banks would cause trouble.

6—In short, the very concentration of the industry in Detroit has brought with it serious disadvantages. The automobile industry is in the same situation as the man who put all his eggs in a single basket.

Attractions in New York.

Now, can New York become a great centre for the manufacture of automobiles? Perhaps, to the casual observer New York might not seem to offer many advantages, but to the manufacturer who is carefully studying the situation New York does offer many advantages which are scarcely equalled by any in the Middle West.

Land values in New York—if we mean Manhattan—are pretty high, and it would not be good policy to locate in Manhattan a plant covering large acreage. But in the wide areas in Brooklyn, Queens, Bronx and Richmond land can be purchased and carried almost as cheaply as in any city in the country.

New York City is not distant from the raw materials, either the raw stuffs which go into the automobile, or the manufacturers who make the various parts. Many of the best automobile steels are made in Pennsylvania, near Philadelphia, and many of the most superior parts are manufactured in and about New York—castings, forgings, drop forgings, etc. New York is becoming a greater and greater centre for the manufacture of accessories, which go into the automobile.

Labor Situation and Market.

It is often urged that labor is high in New York. Labor may be somewhat higher than in a small country town, but it is not higher than in many of the automobile manufacturing centres of the Middle West, where the demand for labor has become acute. In addition to this, the supply of labor in New York, both skilled and unskilled, is large and diversified, and the amount of labor which a manufacturer in New York can command at his doors gives him the ability to "pick and choose." The unions are not recognized in the metal trades in New York City.

In addition to these advantages, New York is the centre of a tremendous market. Within 200 miles of New York City there lives almost one-fourth of the total population of the entire United States. Within 400 miles of New York there is almost one-third of the total population of the country, and within a 200-mile radius there is probably one-half of the producing power of the entire United States. Probably not less than 10 to 15 per cent. of all pleasure cars manufactured in the United States are marketed in a territory within 100 miles of New York City.

Financial and Selling Advantages.

The financial advantages of New York are absolutely the best in the country. If the New York banks have seemed somewhat unresponsive to the automobile industries, it is unresponsiveness born of experience. The New York banks are willing to extend credit to the automobile industry on exactly the same conditions and principles as to other industries.

More important, perhaps, than many of these advantages is the possibility of the New York manufacturer reducing his heavy selling expenses because he can combine under his immediate supervision the manufacturing, selling and service divisions of his business. The advertising value of a location in New York City is of tremendous advantage. It is natural that the citizens of New York should look to the New York manufacturer.

The Export Trade.

The American made automobile is already invading the foreign market and the lowered tariff which is likely to come in the near future will increase our commercial relations with European countries. The New York manufacturer of automobiles will reap the immediate advantages.

New York City offers large natural inducements to the manufacturers of automobiles, even though there may be some disadvantages. It may be that land values and rentals are somewhat higher in New York than in some small western town, but there are advantages on the other hand which compensate. There are acres and acres of comparatively cheap land in the immediate vicinity of New York—in Queens, in Brooklyn, in the Bronx and in Richmond—which will furnish sites for some successful automobile manufacturers who realize the great advantages which the New York market has to offer.

A Correction.

In the February issue the address of the Planhard Manufacturing Company, maker of the Planhard carburetor, was given as Kokomo, Ind., and Philadelphia. It should have read 1790 Broadway, New York City, with factory at Kokomo, Ind.

A half interest in the Pumpelly Battery Company, Indianapolis, Ind., has been purchased by Sidney W. Elston, who becomes secretary and treasurer.

FISK RUBBER WINS SUIT.

Thropp Tire Patent Held to Be Invalid by Reason of Anticipation.

The United States court of appeals for thefirst district, New York City, has rendered an important decision affirming the decree of the district court, which held that the claims of United States patent 822,561 to P. D. Thropp were invalid by reason of anticipation. Suit was brought against the Fisk Rubber Company, Chicopee Falls, Mass., maker of Fisk tires, for infringement of this patent, which it was alleged covered the form of mold used in the manufacture of tire casings by the one-cure wrapped tread process.

This case has been before the courts for nearly four years and the two decisions in favor of the defendant company are of great interest to the tire makers of this country by whom the one-cure wrapped tread process and the apparatus involved in this suit have been used very extensively.

MOTORISTS WERE WASTEFUL.

Vice President Studebaker Thinks Price of Fuel Made Everybody Careless.

That the price of motor fuel rests to a great extent with each individual motorist, and that the industry in general is under a deep obligation to the big oil companies, is the opinion of Clement Studebaker, Jr., first vice president of the Studebaker Corporation, Detroit. He writes as follows:

> I have recently noted several articles, quoting automobile manufacturers and others as deprecating the recent increases in the price of gasoline. Some have even professed to see, in the advance, a menace to automobile popularity and industry. As a matter of fact the difference amounts to but a fraction of a cent for each mile a car and should not, in a season's running of 5000 miles, exceed a total of $25. On the other hand, it is high time that motordom should consider the debt it owes the big oil companies, without whose magnificent organization motoring would never have achieved its present popularity.
>
> Before the internal combustion motor, gasoline was virtually a by-product, on sale at central stations for perhaps 10 cents a gallon. The cost of delivery fell on the buyer and often amounted to more than this figure. The oil companies were glad to sell the gasoline at almost any price, for this enabled them to manufacture at a profit, greater quantities of oils, greases and lubricants. While this condition prevailed the buyers of the staples paid a large share of the motorist's fuel bill.
>
> But gasoline motor cars multiplied and eventually the demand for fuel equalled that for the other products. A year or so ago the old balance was reversed. Now the demand for gasoline greatly exceeds that for the staple oils and greases. And in place of the old method of distribution, the oil companies have established a system which covers the entire country, bringing to the very door of each garage a refined product which has often travelled thousands of miles. When one considers the cost of drilling, pumping, transportation, refining and delivering, he must admit that there is no manufactured product sold as cheaply as gasoline. Even at its present price it costs the consumer less than an equal quantity of most brands of spring water.
>
> When the demand for gasoline came to exceed that for the other crude oil products the manufacturers faced a dilemma. They could not produce gasoline and throw away the other products; such a process would have made the fuel prohibitive in cost. To advance the price of gasoline and to lower the price of the other products was the only available means of regaining the balance. So now we pay more for gasoline and less for oils and greases.
>
> As a matter of fact we have all wasted gasoline; it has been so cheap. A little economy will hurt none of us. Automobile manufacturers have built wasteful cars—cars with motors much larger than necessity demanded; cars that lacked efficiency. But the manufacturer is seeing the light. The recent shows emphasized a new tendency—a tendency toward motors that yield more in miles a gallon. But these cars will fail to save gasoline unless their owners do their part.
>
> Just as a wasteful car raises the cost of gasoline, so every motorist who fails to make his car efficient, makes fuel cost more. Owners of automobiles owe it to each other to start a united effort, keeping track of gallon-miles, watching carburetion, learning the art of controlling a car more by the clutch and less by the brakes. A campaign along this line will save enough gasoline to more than balance the recent increase in cost.
>
> Our office files contain hundreds of letters from tourists whose cars have averaged from 15 to 25 miles a gallon on ordinary country roads, and a car should yield at least 10 miles a gallon in city traffic where there are many more starts and stops. If motorists generally would regard these averages as standard and would strive to exceed them, the condition would be immediately relieved.
>
> The cost of gasoline will advance no further than the necessities of the oil companies' production require. These necessities are, to a large degree, in the hands of motorists themselves.

OFFERS FUEL ECONOMY TROPHY.

Chas. E. Miller Deeply Interested in Holding Contest of This Character.

In view of the present interest in the price and quality of motor fuel, Chas. E. Miller, the pioneer accessory man of 97-103 Reade street, New York City, announces his intention to donate a suitable trophy to be awarded to the car and carburetor which makes the best showing in fuel economy in a series of road tests to be conducted throughout the country. He believes that the award should be made on the basis of ton-miles a gallon, as the final test of efficiency.

Mr. Miller recalls that four years ago, during the automobile carnival in New York City, a fuel economy test was conducted by the local dealers' association under the direction of a committee of engineers. Later a similar event was held by the Automobile Club of Buffalo, utilizing the same set of rules and conditions. He believes that a series of tests of this character will do much to call attention to the economy possible by utilizing the devices now in the market. He says:

"During 1912 automobiles used 12,000,000 barrels of gasoline, which is an increase of 40 per cent. over the previous year. Notwithstanding the increased use of automobiles, if this large consumption of gasoline is not kept down by better mechanical outfits, the price of gasoline must increase. There are a host of good carburetors on the market, some of which are used by the makers of cars and some are not. Many of them, as well as the attachments called 'gas-savers,' really save from 20 to 40 per cent., so that their use more than pays for their extra cost and the expense of changing carburetors. Surely, every user of an automobile is interested in reducing the cost of maintenance, in which gasoline figures so largely."

Stockholders of the Lozier Motor Company, Detroit, maker of Lozier cars, at a recent meeting authorized an increase in the company's capital from $3,000,000 to $5,000,000.

FRONTIER COMPANY EXPANDING.

Buffalo Tire Concern Seeking Representation in Numerous States for Active Sales Campaign.

The Frontier Company, Buffalo, N. Y., maker of Frontier tires for several years, has been very successful in the introduction of its product, which has been very favorably received and has given excellent service and satisfaction. The company is now planning the inauguration of an energetic sales campaign and is seeking representation in various states throughout the country, preparatory to greatly extending its scope.

The Frontier plant is equipped with the latest machinery for washing, drying, mixing and compounding the rubber and also for drying and frictioning the fabric, but the company deems best to continue the manufacture of hand made tires until such time as it has been demonstrated that they can be made as well or better by machinery, the latter method being considered by it as still in an experimental stage. The concern states that it will not sacrifice quality in any respect, but will maintain the high standard which has been established since it commenced doing business.

RADIATOR LEAK-PROOF CEMENT.

New Nickel Polish Also Being Produced by the International Metal Polish Company.

The International Metal Polish Company, Quill street and Belt railway, Indianapolis, Ind., maker of the well known Blue Ribbon cream metal polish and auto body gloss, has brought out a new material known as the Blue Ribbon radiator leak proof cement, which the manufacturer claims will stop any ordinary leak. It is introduced into the radiator when the latter is full of water, and the engine is operated until the cement is thoroughly circulated. If the radiator is dirty and rusty it is necessary to first flush it out and clean it, after which it is refilled before introducing the cement, which is guaranteed to close up every crevice. As the solution comes into contact with the air at the leak point it immediately closes the fracture and mends it by forming a permanent and lasting cement filling. It also is held to clean out the circulating system and to prevent scale and rust from forming, thus preserving the metal and increasing the cooling capacity.

The International company also is producing a new polish especially adapted to nickel surfaces which will be appreciated by motorists. To dress the car up right the maker recommends this article as being high class in every respect. The many years of experience of the company in the manufacture of gold and silver polishes and other polish specialties has enabled it to produce a nickel polish which is not an experiment and one which is guaranteed to give perfect results.

The company's Blue Ribbon auto body polish is held to be particularly desirable for use on a high class automobile. It dries dust proof immediately, leaving no grease on the surface and makes the machine look like new. It is also valuable for cleaning, preserving and brightening leather trimmings. The well known Blue Ribbon cream metal polish does not require shaking, the ingredients being carefully blended and in the form of an emulsion. The liquid is greaseless and being free from any sediment it is said not to collect in crevices no matter how liberally applied. It is designed to remove quickly and easily all tarnish from metals and not to soil fabric. It is put up in five and 10-gallon cans for garage and service stations and in smaller containers for car owners.

WOULD ORGANIZE BUYERS.

H. E. Gilman Has Plans for a National Association of Purchasing Agents.

The following communication is submitted by H. E. Gilman, now with the Marathon Motor Works, Nashville, Tenn., maker of Marathon cars. He believes there is opportunity for the organization of the buyers in the industry and his letter is self-explanatory.

About three years ago—when residing in the East—I conceived the idea of the formation of "The Buyer's Club of America" and carried this project almost to the point of incorporation, but when I left and went to the Middle West to reside, temporarily, gave up the idea.

At the time I endeavored to promote this scheme I wrote several hundred letters to leading buyers of the country, and practically every reply received showed that the scheme was met with great enthusiasm; in fact, a great number of buyers congratulated me on taking the initiative to bring together those affiliated with the buying interests of this country. It is manifest that the benefits to be derived are manifold.

It would be my idea to have the headquarters of this club either in New York or Chicago; using the top floor of some hotel centrally located, fitting it up in the most modern way and having everything connected with it up-to-the-minute. The object of this club would be—tersely speaking—to bring closer together those connected with the purchasing end of our organizations. There would undoubtedly be a mutual helpfulness resulting.

There is no such organization in existence today, and if the traffic men, engineers and men of other vocations of life can maintain a club, why cannot we purchasing agents do the same thing? Anybody connected with the metal industry would be eligible to membership. This organization, when once perfected, will not only be national, but will be international in its scope.

At the time I originally thought of this idea the Iron Age gave me an editorial, and numerous letters, both foreign and domestic, were written me on the subject, showing that great interest was manifested. What I want you to do is to give me a small space in your editorial columns and request any purchasing agent who might read the article to communicate with me direct, in care of the Marathon Motor Works, Nashville, Tenn., and I would be most pleased to receive your comments and criticisms pro and con on this subject.

I have the by-laws drawn up and the certificate of incorporation ready to be executed.

The Mohawk Rubber Company, capitalized at $350,000, has been organized at Akron, O., and has purchased the Stein Double Cushion Tire Company's plant and machinery. Of the capital, $250,000 is common and $100,000 is 7 per cent. cumulative preferred, redeemable at 110 with accrued interest after Jan. 1, 1916. The Stein company has discontinued and liquidated its business.

PUBLISHER'S PAGE

Advertisers, especially those using motoring publications, purchase space with the purpose of producing the greatest results possible from the money expended. The standard is 100 per cent. circulation value. A magazine with a distribution of from 15,000 to 18,000, divided between trade and owners, has an advertising value proportionate to the classes it reaches, with the possibility of a considerable part, remote from the home office of the advertiser and his branches, being unproductive. The publication devoted to several classes cannot have the productiveness it would have were it specialized for one class only. No magazine can vary its classes of readers with reference to advertising value. To become established and recognized requires time and development expense. To change is to acknowledge weakness.

No publication in America other than the ACCESSORY and GARAGE JOURNAL has a distribution exclusively to the motor vehicle and allied industries and the trade. This circulation is guaranteed in any manner requested by an advertiser to be 12,000 a month. It is a trade magazine and, dealing with business, it is read by business men. To reach the same number of business interests it would be necessary to use all other motoring magazines in combination, which would involve duplication of circulation and entail a cost that would be prohibitive. Should a mailing list of 12,000 names be maintained and used the cost of circularizing would be 10 times the price of page space per issue in the ACCESSORY and GARAGE JOURNAL.

The mailing list of the ACCESSORY and GARAGE JOURNAL is the most authentic compilation of trade interests in existence. To reach the trade, trade propositons should be made. Advertising to reach owners is an entirely different propositon. The ACCESSORY and GARAGE JOURNAL is the only print advertisers can use and know they are receiving a service that reaches every trade interest. Its readers are buyers, for they are business men.

The next issue of the ACCESSORY and GARAGE JOURNAL will be mailed May 15. Its art department is at the service of its advertising patrons, and no charge is made for designs furnished that are used in advertising in its pages.

THE ACCESSORY and GARAGE JOURNAL

TIMES BUILDING PAWTUCKET, R. I.

AUTOMOBILE JOURNAL ANNUAL TOURING NUMBER

The Annual Touring Number of the Automobile Journal will issue July 10, and, as in past years, it will be an encyclopedia of touring information. The demands for this edition have been enormous, and the number of copies printed has been at least equal to the distribution of any route or guide book.

The Annual Touring Number of the Automobile Journal will be extensively advertised. It will be the most comprehensive ever published. Its information will relate to every section of the country. The data will include more than 500 distinct tours. It will be invaluable to every motorist desiring to tour.

As an advertising medium this number will have remarkable value. Having all the qualities of any route or guide book, and selling for 10 cents the copy, the distribution will be in excess of 30,000. It will be preserved because it has a distinct use in the hands of the readers, and its publicity will continue until the issuance of a number to replace it.

The Automobile Journal is the most widely read motoring publication in America. Its circulation is more than 90 per cent. to motor car owners. The distribution outside of New England, New York, Pennsylvania, New Jersey, Delaware and Maryland exceeds 5000 copies. Advertisers in its pages reach the greatest motor vehicle and accessory market in the country, as well as a general distribution to motor car owners throughout the United States.

AUTOMOBILE JOURNAL PUBLISHING COMPANY

TIMES BUILDING PAWTUCKET, R. I.

1913 1914

AUTOMOBILE AND TECHNICAL SCHOOLS

The AUTOMOBILE MECHANICAL BOOKS published by this company, completely rewritten and revised to the minute, are ready for distribution.

The series now comprises 10 books, containing 800 pages of text and more than 1500 illustrations, and it is the most complete library of motor vehicle information ever published.

Write for 1913-14 School Proposition and Rights.

More than 80 per cent. of the AUTOMOBILE and TECHNICAL SCHOOLS of the United States and Canada now use these books—MORE THAN 500,000 COPIES WERE SOLD LAST YEAR.

We Want School Patronage. These Books Are Especially Valuable For School Requirements.

TO THE TRADE

That schools and educational institutions use these books in connection with regular courses of tuition establishes their value. The works are equally as valuable to agents for cars and service wagons, repairers and those who deal in motor vehicle equipment and supplies.

The practical information contained in these books, relating to design, construction, care, maintenance and operation of all forms of motor driven wagons and trucks cannot be acquired through a life time by experience. The books are non-technical and all illustrations can be comprehended by the novice.

The full series includes the following:

The Automobile Journal (Subscription, one year)	$1
The Motor Truck (Subscription, one year)	$1
The Accessory and Garage Journal (Subscription, one year)	$1
The A B C of Internal Combustion Engine Maintenance and Repair	35c
The A B C of Magneto Ignition Systems	35c
The A B C of Carburetor Construction, Maintenance and Repair	35c
The A B C of Battery Ignition Systems	35c
The A B C of Motor Car Operation	50c
Overhauling, Rebuilding and Repairing the Motor Car	50c
Lighting the Motor Car by Electricity	50c
The A B C of Motor Car Chassis Maintenance and Repair	25c
Maintenance and Repair of Motor Car Tires	25c
The Motorcycle, Maintenance, Repair and Construction	35c
The A B C of Aerial Navigation	$1

The 10 books constitute a complete library of automobile mechanical information. All books are fully indexed for instant reference.

AUTOMOBILE JOURNAL PUBLISHING COMPANY

TIMES BUILDING PAWTUCKET, R. I.

FRONTIER
A LONG RUN FOR YOUR MONEY

YOU CAN MAKE MORE MONEY SELLING
FRONTIER TIRES
than you can on any other. Desirable territory open. Discounts upon application.

Our new non-skid has created a sensation and sells itself.

WRITE FOR DETAILS

FRONTIER TIRE & RUBBER CO.

1054 Main Street, Buffalo, N. Y.

Let's Get Together

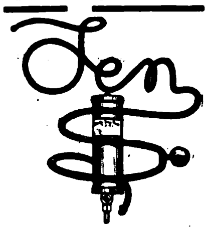
YOU Are looking for good goods which are easy to sell and which stay sold.

WE Manufacture high class, honeycomb, square-cell RADIATORS—for replacement on FORD, Buick, Chalmers, Hupmobile and other cars—Our guarantees are liberal and prices right—We also do repair work.

SEND FOR PRICE LIST

EL ARCO RADIATOR COMPANY

Office Broadway and 57th St. Factory, 10 East 31st St.
NEW YORK CITY



AIR COSTS LESS THAN RUBBER

The Dewey Power Tire Pump

Makes it easy to keep your tires at economical pressure with pure, untainted air.

Our Price—$10—Is For a Complete Pump Which Has Special Advantages That Will Interest You.

The cost of a pump is literally nothing as compared with the hundreds of dollars it can save you.

The Dewey, in addition to advantages not found in other pumps, is the only one that requires no oil. It can't spray grease into your tires to rot them. It pumps pure air only.

The Dewey isn't simply a lazy man's makeshift. To the saving it makes in your tire bill, you must add the saving to the car itself by the use of tires that are properly inflated at all times.

The Dewey, with high grade Dial and all connections, including 12 feet of Special Hose, tested to 1000 lbs., sold everywhere under a year's rigid guaranty for **$10**

Write us if your dealer cannot promptly supply you with the Dewey.

THE DEWEY-ANDERSON CO.,

450 Woodruff Ave. Toledo. Ohio

HOPEWELL
TIRE CASE

ABSOLUTE TIRE PROTECTION
GIVEN ONLY BY THE
Hopewell Tire Case

It prevents any water entering the spare tire (either from rain or hose used in washing). Water rots the fabric and causes blowouts.

$3.00 to $4.00 according to size

Hopewell Brothers Newton, Mass.

New Departure
"TWO-IN-ONE"
Ball Bearings

The only ball bearing that takes load from any direction with equal efficiency.

Catalog for the asking

THE NEW DEPARTURE MFG. CO.
Bristol, Connecticut

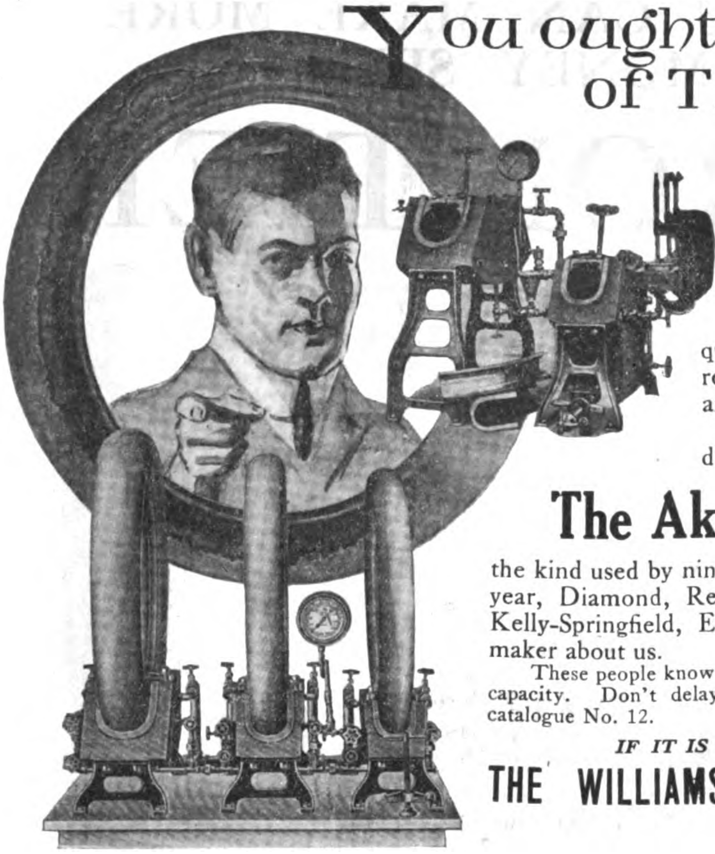
"PASS THEM ALL"

Knox
BEST BY TEST
MOTOR CARS

Send for Pleasure or Commercial Catalogue.

KNOX AUTO CO., Springfield, Mass.

You ought to share in the profits of TIRE REPAIRING



Forty Million Dollars will be spent during 1913 for tire repairs. Every hundred cars will produce at least $3500.00 worth of this profitable business. Every motorist must have tires repaired. Every motorist in your vicinity is a possible customer.

There are large profits in tire repairing. Requires little capital to equip a shop with the best repairing outfit made. The equipment can be paid for and a good profit earned in a short time.

Get the right kind of equipment—one that produces work you can guarantee—

The Akron-Williams Equipment,

the kind used by nine out of ten such manufacturers as Firestone, Goodyear, Diamond, Republic, Shawmut, Walpole, Federal, Pennsylvania, Kelly-Springfield, Empire, Ajax-Grieb, Swinehart, etc. Ask your tire maker about us.

These people know what is practical. We can equip a repair plant of any desired capacity. Don't delay getting into this profitable business. Write today for catalogue No. 12.

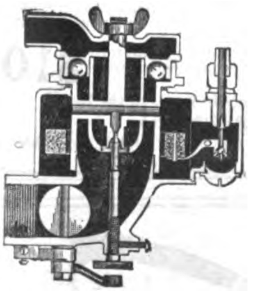
IF IT IS USED TO REPAIR TIRES WE MAKE IT

THE WILLIAMS FOUNDRY & MACHINE COMPANY
ASH STREET, AKRON, OHIO

We do not want Retail Profits

DEALERS:

GET OUR PROPOSITION



Note Simplicity.

If you sell one man He will sell all of his friends for you

Satisfaction or money back guarantee, is the only basis on which Planhards are sold.

Send for interesting charts showing saving of gasoline on a basis of 20 cents a gallon.

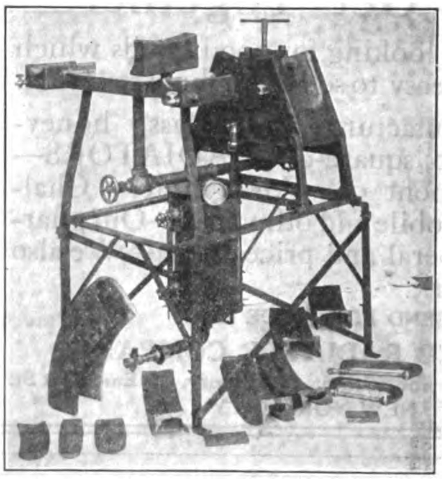
Planhard Carburetors

¶ The flexibility and control amazes new users. No springs, valves or cams. Absolutely automatic. Permanent adjustment.

¶ Show 10% to 25% saving in gasoline, tremendous power, increased speed.

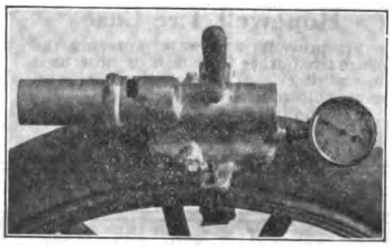
A. N. Smith, Portland, Me., uses about one gallon less per hour on Hartford III. G. A. Schmidt, Lawrence, Mass., gets over 20 miles to a gallon on his automobile. The Planhard is made for 2 and 4 cycle motors, either low or high speed.

PLANHARD MFG. CO., 1790-2 Broadway, N. Y.



Make Big Money

Start vulcanizing in your garage or open up a shop. Get into it now while the business is new and growing fast. Start with our shop outfit, cost $60, less 5% cash. Ask for Catalogue C. Tells how to do the work.



Van Steam Portable

$4.50 for Sample and we pay the postage. Made to repair tires on the rim, a great tire saver.

Vanderpool Company
Springfield, Ohio

NOTICE

"Thomas Car" Owners

The service department and the repair-parts department of the E. R. Thomas Motor Car Company have been purchased by C. A. Finnegan, Buffalo, N. Y. These departments will be continued in full operation at the old address, 1200 Niagara Street, Buffalo, N. Y. All orders for

Parts and Repairing

will receive careful and prompt attention.

Save This Notice

This advertisement will NOT appear again. Either make a permanent note of the address or save the whole notice.

Address All Communications and requests to

E. R. THOMAS
MOTOR CAR CO.
1200 Niagara Street
BUFFALO - - NEW YORK

If You Use

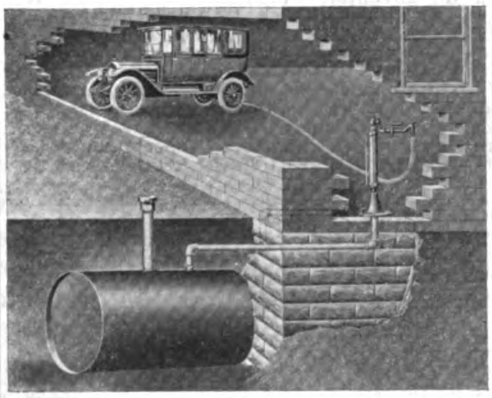
HARRIS
TRADE MARK REG. U.S. PAT. OFF.
OILS

Your motor will respond by giving better service.

A little goes a long way and every drop counts.

A. W. HARRIS OIL COMPANY

326 S. Water St., PROVIDENCE, R. I. 143 No. Wabash Ave., CHICAGO, ILL.



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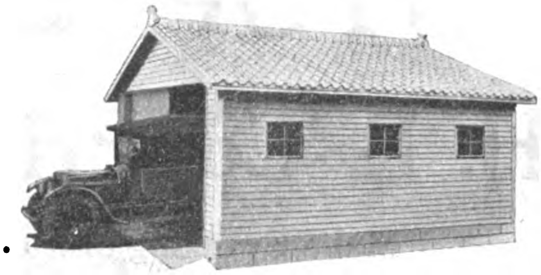

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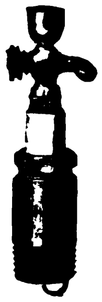

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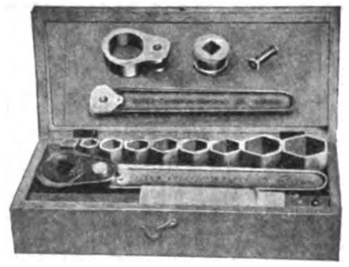

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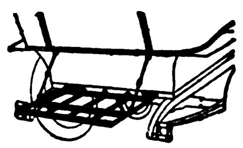

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